# HP Insight Management Agents

## User Guide

# Contents

# 1 HP Insight Management Agents for Servers

The HP System Management Homepage version 8.25 and later acts as the Web server for the Management Agents. For additional information, see the System Management Homepage Online Help.

## Browser requirements

The minimum browser requirements include support for tables, frames, Java™, JavaScript, and Java Development Kit (JDK) 1.1. Additional browsers, or the browsers mentioned, used with different operating systems, might not work correctly, depending on their specific implementations of the required browser technologies.

The requirements are TCP/IP and one of the following browsers:

Table 1-1 **Browser requirements**

| To view systems running | Browser requirements |
|---|---|
| Novell NetWare 4.*x*, 5.*x*, 6.*x* | • Microsoft Internet Explorer 5.5 and 6.0<br>• Netscape Navigator 4.73 and 6 |
| Microsoft® Windows Server® 2008 | • Microsoft Internet Explorer 7.0 or later<br>• Microsoft Internet Explorer 5.5 and 6.0 |
| • Microsoft® Windows Server® 2003 | • Microsoft Internet Explorer 7.0 or later<br>• Microsoft Internet Explorer 5.5 and 6.0 |
| Tru64 UNIX 4.0F and later | Netscape Communicator 4.5 or later |
| Red Hat Enterprise Linux 4 x86 and EM64T/AMD64 | • Windows: Microsoft Internet Explorer 5.5 and 6.0<br>• Mozilla Firefox v3.0 |
| Red Hat Enterprise Linux 5 x86 and EM64T/AMD64 | • Windows: Microsoft Internet Explorer 5.5 and 6.0<br>• Mozilla Firefox v3.0 |
| SuSE Linux Enterprise Server 9 x86 and EM64T/AMD64 | • Windows: Microsoft Internet Explorer 5.5 and 6.0<br>• Mozilla Firefox v1.8 |
| SuSE Linux Enterprise Server 10 x86 and EM64T/AMD64 | • Windows: Microsoft Internet Explorer 5.5 and 6.0<br>• Mozilla Firefox v2.0 |
| SuSE Linux Enterprise Server 11 x86 and EM64T/AMD64 | • Windows: Microsoft Internet Explorer 5.5 and 6.0<br>• Mozilla Firefox v3.0 |

**IMPORTANT:** For the HP Insight Management Agents to work properly, configure the following browser options:

- Enable Java
- Enable JavaScript
- Accept all cookies

## Java Virtual Machine requirements

HP Web-Enabled System Management software requires Java for full functionality. At a minimum, the help system relies on a Java applet to provide a table of contents, an index, and search capability. Depending on what Web-Enabled System Management software is installed, there might be other features that are either partially or fully dependent on the presence of Java support in the browser.

### Obtaining JVM from the HP Management CD

The Sun Java Virtual Machine (JVM) can be obtained directly from the HP Management CD. The Management CD ships with all ProLiant servers and certain server options. In addition, you can obtain a subscription to the Management CD to have the latest available software delivered directly to you. For subscription information, see the HP website **http://www.hp.com/servers/manage**. The JVM is located in the Management CD directory `<cd>\INSIGHT7\JVM\` and is a single installable package. This version of the JVM is qualified for HP Systems Insight Manager and the Web-Enabled System Management software installed on HP devices.

### Obtaining JVM from Microsoft

Java support for Internet Explorer can be downloaded from Microsoft at **http://www.microsoft.com/java/sdk**, where the JVM is contained in the Microsoft Software Development Kit (SDK) for Java. Microsoft Windows Update, **http://windowsupdate.microsoft.com**, also provides a Microsoft virtual machine (VM) (or updated version of the VM if available).

### Obtaining JVM from Sun

Java support can be downloaded from Sun for both Microsoft Internet Explorer and Netscape Navigator from the Sun website at **http://java.sun.com**.

# Updating Netscape Communicator for Tru64 UNIX workstations

To update your version of Netscape Communicator, download the software from **http://www.netscape.com**.

For the Tru64 UNIX Server agents, the Netscape option, "Accept cookies originating from the same server as the page being viewed," can be used instead of "Accept all cookies."

# Accessing HP Insight Management Agents from a browser

## Accessing from a Microsoft operating systems

The HP Insight Management Agents for Servers enable you to view subsystem and status information from a Web browser, either locally or remotely.

To view data locally on Microsoft operating systems, access **https://127.0.0.1:2381** or **https://localhost:2381**.

The Management Agents can also be browsed locally by selecting **Start>Programs>HP Management Agents>HP System Management Home Page.**

To view data remotely on Microsoft OS access **https://machine:2381**, where "machine" is the IP address or the computer name under DNS.

**NOTE:** Notice that the URL is followed by 2381. This is the port or socket number that the HP Insight Management Agents for Servers use to communicate with the browser. If this number is not specified, the browser might attempt to connect to another Web page if the managed server is running a Web server.

After you enter the URL, there is a certificate challenge followed by a login screen.

## Accessing from another operating systems

To access Insight Management Agents from a browser running on a machine not running a Microsoft OS, complete one of the following procedures:

1. To view data locally, access through either of the following connections:
   - Secure connection: **http://127.0.0.1:2301**
   - Unsecure connection: **http://localhost:2301**

   To view data remotely, access through **http://machine:2301**, where "machine" is the IP address or the computer name under DNS.

2. To access Insight Management Agents from a browser running on a machine running Novell NetWare or operating systems other than Microsoft, and to view data locally, use either of the following connections:
   - Secure connection: **http://127.0.0.1:2381**
   - Unsecure connection: **https://localhost:2381**

   To view data remotely, access **https://machine:2381** , where "machine" is the IP address or the computer name under DNS.

**NOTE:** Notice that the URL is followed by 2301. This is the port or socket number that the HP Insight Management Agents for Servers use to communicate with the browser. If this number is not specified, your browser might attempt to connect to another Web page if the managed server is running a Web Server.

**NOTE:** Notice that the URL is followed by 2381 which identifies secured way of accessing the URL, which starts with https.

After you enter the URL, the System Management Homepage appears.

# Security

The HP Insight Management Agents allow SNMP sets for some system parameters. This capability requires security that includes the three predefined users. Agents running on Microsoft and Linux operating systems have no default passwords. On a fresh install the administrator password, operator password, and user passwords are configured during installation. For agents running on other operating systems, the default passwords are defined in Table 1-2.

Table 1-2  Password

| Account | User name | Password |
| --- | --- | --- |
| anonymous | anonymous | |
| user | user | public |
| operator | operator | operator |
| administrator | administrator | administrator |

**NOTE:**  These are the only user accounts available in this release, and they cannot be changed except for the password. Under Tru64 UNIX, the account names, user names, and passwords are lowercase characters.

The Web-Enabled HP Management Agents for Servers for NetWare is located in the `WEBAGENT.INI` file in the `SYS:\SYSTEM\CPQMGMT\WEBAGENT` directory. It specifies the level of user who has access to data. The "read=" and "write=" entries in the file set the user accounts required for access, where:

- 0 = no access
- 1 = anonymous
- 2 = user
- 3 = operator
- 4 = administrator

Changing these entries changes the security level.

When the System Management Homepage is launched for the first time on operating systems other than those from Microsoft and Linux, anonymous access to information is available without logging in.

# Deploying the configurations to servers running Microsoft® Windows®

On systems running Microsoft OS, anonymous access is disabled by default.

To turn on anonymous access, complete the following steps:

3. Open the System Management Homepage
4. Select **Settings>SMH>Security>Anonymous/Local Access**.
5. Select either of the following access types:
   - Anonymous
   - Administrator

# Deploying the configurations to servers running Tru64 UNIX

Under Tru64 UNIX, the location of the `WEBAGENT.INI` file depends on whether the Management Agents for Tru64 UNIX were installed as part of the base operating system or as an upgrade. You can determine the location of the `WEBAGENT.INI` file by issuing the following command:

# ps -ef | grep -i cpqthresh_mib | grep -v grep

The command output resembles one of the following lines:

root 12278 1 0.0 … /usr/sbin/cpqthresh_mib

root 12278 1 0.0 … /var/opt/CPQIM100/bin/cpqthresh_mib

Use the path name displayed in the output of the ps command to locate the `WEBAGENT.INI` file on your system as follows:

- The `WEBAGENT.INI` file is located in the directory /var/im/webagent if the pathname is /usr/sbin/cpqthresh_mib.

- The `WEBAGENT.INI` file is located in the directory /var/opt/CPQIM*ddd*/web/im/webagent if the pathname is /var/opt/CPQIM*ddd*/bin/cpqthresh_mib, where the value *ddd* indicates the version of the Management Agents installed on the system.

The Web Agent service must be stopped and restarted for any changes to take effect for Tru64 UNIX operating systems.

## Deploying the configurations to servers running Linux

The configuration settings for the Management HTTP Server are stored in three files. The passwords for the Management HTTP Server are stored in `/var/spool/compaq/wbem/cpqhmmd.acl`.

The configuration settings for the Management HTTP Server that existed through version 3.*x* is stored in `/var/spool/compaq/wbem/homepage/cpqhmmd.ini`.

The configuration settings for the Management HTTP Server that were introduced in version 4.*x* and later are stored in `/var/spool/compaq/wbem/homepage/cpqhmmdx.ini`.

To deploy the Management HTTP Server configuration to other servers, copy the corresponding ACL file and INI files previously listed.

Three types of data exists:

- Default (read only)
- Sets (read/write)
- Reboot (read/write).

The `.INI` files located in `/opt/compaq/webagent` are the configuration files used by the Web-Enabled HP Insight Management Agents.

## Deploying the configurations to servers running NetWare

In NetWare, the `webagent.INI` file is located in the `sys:\system\cpqmgmt\webagent` directory and specifies the level of a user with access to data. The "read=" and "write=" entries in the file set the user accounts required for access:

- 0 = No access
- 1 = anonymous
- 2 = user
- 3 = operator
- 4 = administrator.

Changing these entries changes the security.

The Web Agent service must be stopped and restarted for any changes to take effect. Do not modify anything except the read/write levels to change the security.

# Management HTTP Server first-time initialization

## Introduction

The System Management Homepage is the one-stop-centralized simple view for all the management information and configuration data generated by Web-Enabled System Management software and utilities. The status of the management software and utilities installed on the system is aggregated on the System Management Homepage. Integrated help on the Homepage provides all the pertinent help information for the management software and utilities on the system.

## What is Management HTTP Server?

The Management HTTP Server is a web server embedded in much of the HP Web-Enabled System Management software.

## Overview

After a product that uses the Management HTTP Server has been installed and configured, a few things occur the first time the Management HTTP Server is initiated. Upon initialization, the Management HTTP Server creates a private key and a corresponding self-signed, Base64-encoded certificate. This process only occurs the first time that the Management HTTP Server is started. The certificate is stored on the file system as `\compaq\wbem\cert.pem`. The `\compaq\wbem` subdirectory also contains the private key. To protect the key, this subdirectory is only accessible to

administrators if the file system enables it. For private key security reasons, HP recommends that the Management HTTP Server be installed on Windows NT® file systems (NTFS).

**NOTE:** For Microsoft Windows operating systems, the `\compaq\wbem` subdirectory must exist on an NTFS file system for the private key to have administrator-only access through the file.

If the private key has been compromised, the administrator can delete the `\compaq\wbem\cert.pem` file and restart the server. This action prompts the Management HTTP Server to generate a new certificate and private key.

# Logging in

The Login dialog box enables you to access any of the available Web agents. To access an agent, complete the following steps:

1. Navigate to **https://devicename:2381**. The first time you browse to this link, the Security Alert dialog box appears prompting you to indicate whether to trust the server.

**NOTE:** The Security Alert dialog box shown is specific to Internet Explorer. However, Netscape 4.0 and later is supported as well.

**NOTE:** If you want to implement your own Public-key infrastructure (PKI) or install your own generated certificates into each managed device, you can install a Certificate Authority Root Certificate onto each browser to be used for management. If this certificate is implemented, the Security Alert dialog box, shown in the following illustration, should not be displayed. If the alert displays when you do not expect it, you might have browsed to the wrong device. For more information on installing the Certificate Authority Root Certificate, see the online help in the browser.



2. Click **Yes**. The Login page appears.
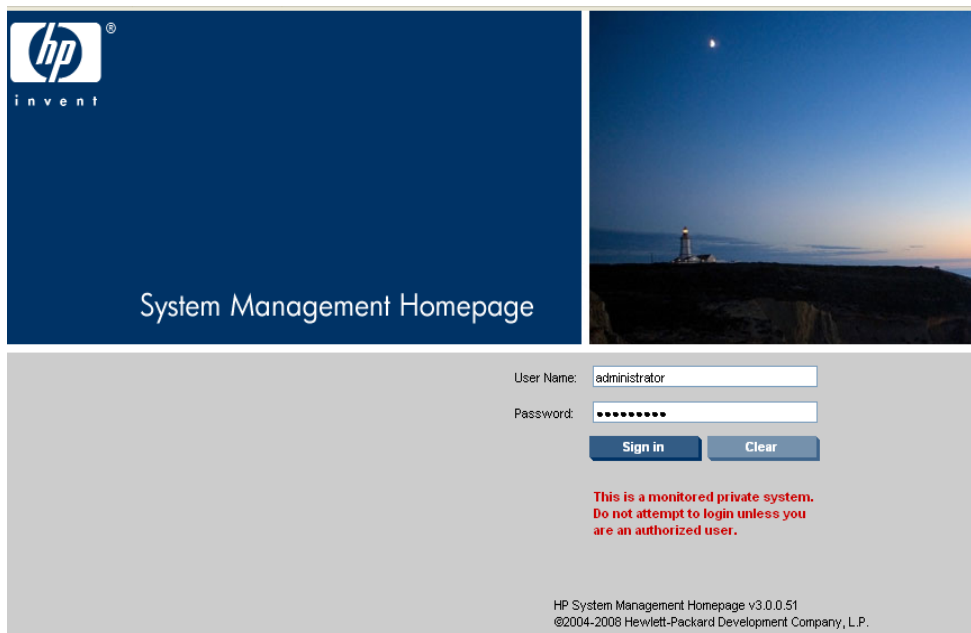
**NOTE:** If you have enabled anonymous access, then you can access the System Management Homepage displays without asking for any credentials locally.

3. Enter the user name and password.

   If the login fails, specify the domain and user name username in the **User Name** field (domain name\username).

4. Click **Sign In**. The System Management Homepage appears.

**NOTE:** For the Version Control Repository Manager, the anonymous login (if enabled) and the user login enable you to access all pages. However, you cannot configure a repository; delete, copy, or create ProLiant Support Packs; install components; or clear the log. The anonymous login is disabled by default.

# System Management Homepage

The System Management Homepage displays all HP Web-Enabled System Management software that provides information. In addition, the System Management Homepage displays various boxes. Each of them containing the proper heading with the set of items associated with it. Heading of head box contains the overall status of the box/heading followed by the each of the items listed also prefixed by the current status of the item.

The page is divided into the following two sections:

- **Header frame**—The header of the System Management Homepage displays navigation tabs and session information.
- **Body Frame**—The body of the System Management Homepage displays the status for all HP management system details.
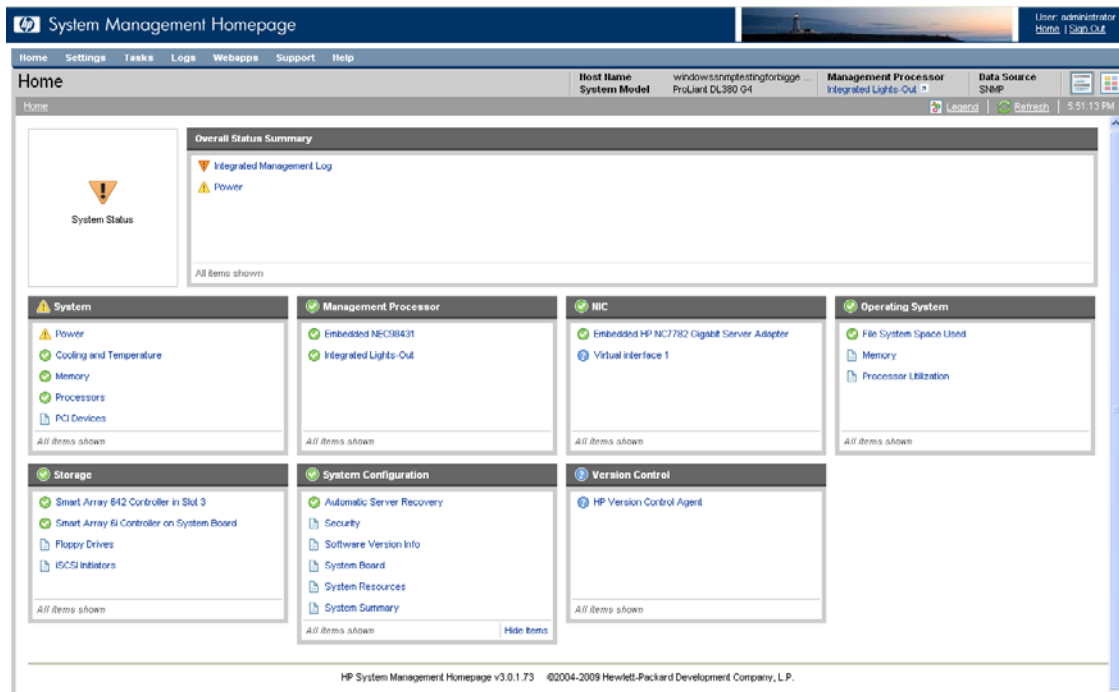
# Header frame

The header frame is always visible regardless of which tab you are viewing. A link, located in the top section, displays the path you are currently viewing along with the System Management Homepage tabs.

The System Management Homepage header displays the following information:

- User
- Home link
- Sign out
- Host name
- System model
- Management processor – Integrated Lights Out
- Data source
- Switch to List view
- Switch to Icon view
- Legend
- Refresh

## User

The User field displays the identity of the user that is currently logged in. If the current user is administrator, then a Sign Out link displays.

If anonymous access is enabled and you are accessing the page anonymously, the User displays "Anonymous," and the Sign In link displays.

If Local Access is enabled and you are accessing the HP Web-Enabled System Management software from a local machine, the Current User displays Administrator or Anonymous (depending on what level of access has been enabled) and Local Access.

## Home

One click on this link navigates the user to the Home Tab.

## Sign Out

Signs you out of the System Management Home Page, and then returns to the System Management Home Page login page.

## Host Name

Displays full computer name of the system.

## System model

The System Model displays the model of the device. In some cases, the System Model might display "Unknown" if the HP Insight Management Agents are not installed on the device.

## Management Processor – Integrated Lights Out

Provides access to the HP Integrated Lights Out page associated with the system.

## Data Source

Indicates which agents are populating data to the System Management Homepage. WBEM and SNMP are the two possible data source values which supply value to the fields in the System Management Homepage.

## Switch to List View

Displays the System Management Homepage contents in windows.
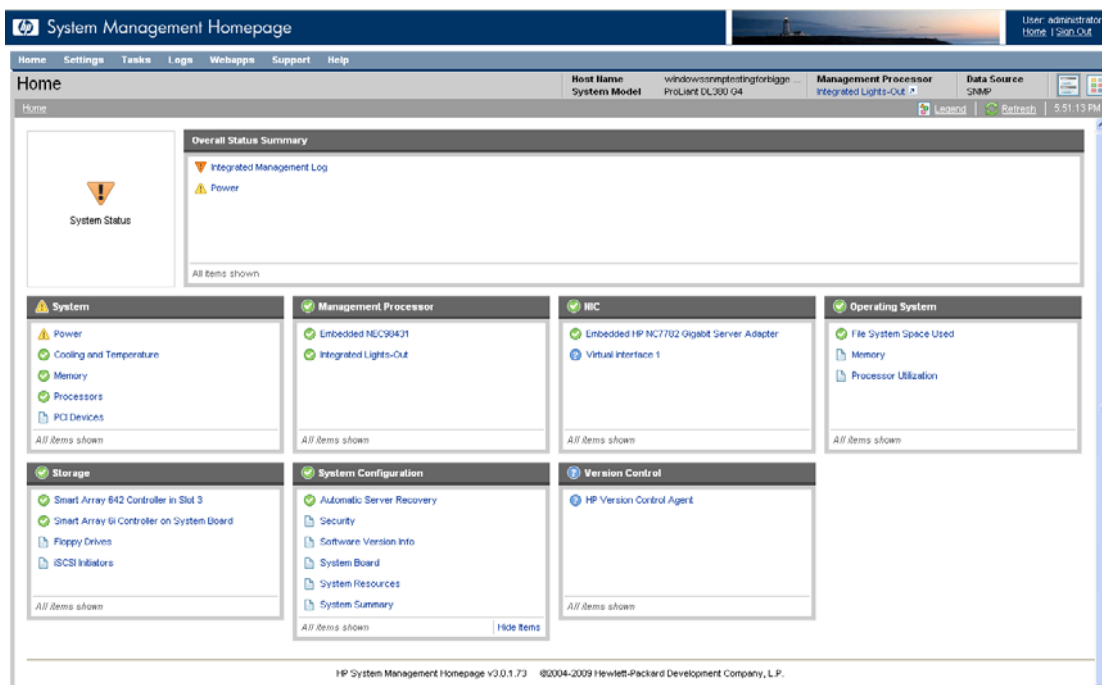


## Switch to Icon view

Displays the System Management Homepage contents as folder icons.
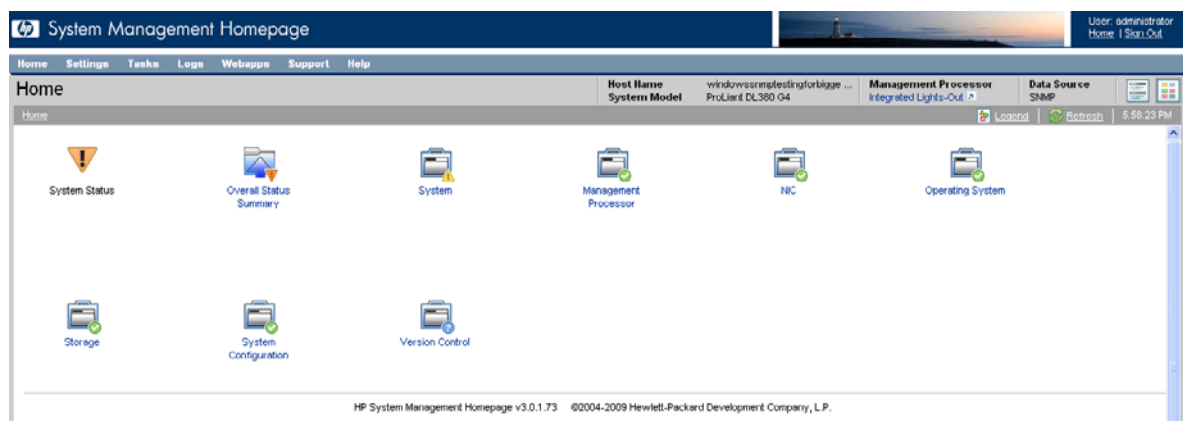


## Legend

Displays the meaning of the status icons.
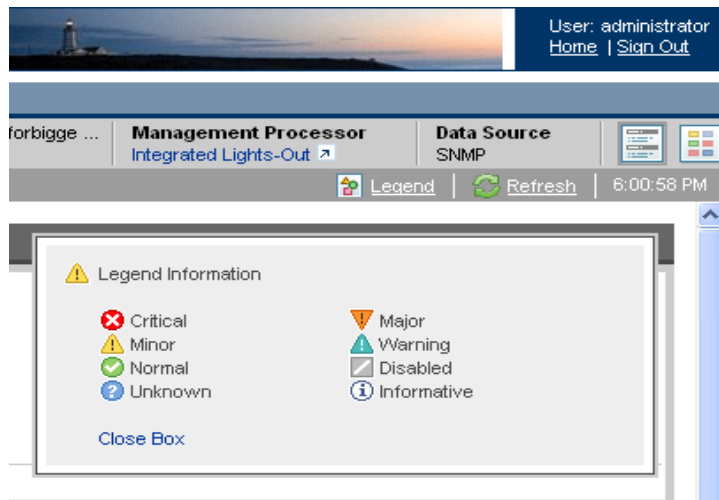
## Refresh

Click on the **Refresh** link to refresh the System Management Homepage.

.

## Body frame

The body of the window displays the status for all HP management system details.

# System Management Homepage tabs

The System Management Homepage displays up to five tabbed pages that enable you to access and configure settings related to participating HP web-enabled System Management software.

The System Management Homepage tabs that can be displayed are the following:

- Home
- Settings
- Tasks
- Logs
- Webapps
- Support
- Help

## Home tab

The Home tab is displayed on the System Management Homepage. The following information is displayed on the Home tab:

- System Status
- Overall System Status Summery
- System
- Management Processor
- NIC
- Operating System
- Storage
- System Configuration
- Version Control
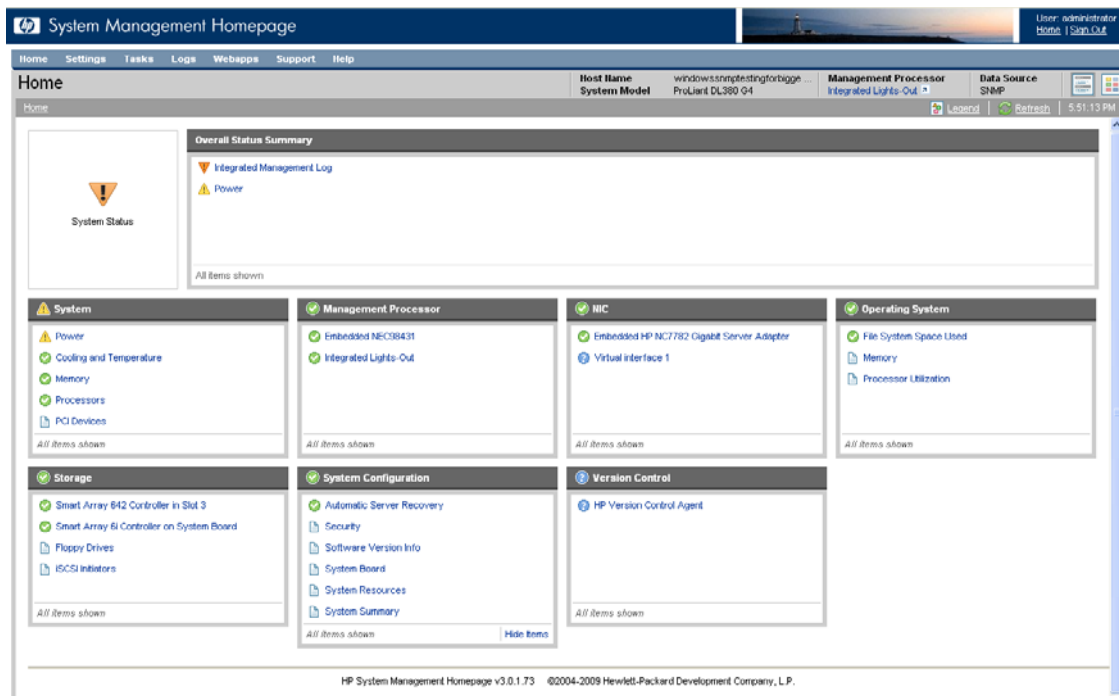
## System Status

The System Status window displays an icon for the overall status of the system.  The system status is determined by the status of the system components. For example, if a system component has a status of "major," then the overall system status is set to "major" even if all other components have a status of "minor."

## Overall Status Summary

The Overall Status Summary window displays the components that have a status of minor, major or critical.

## System

The System window displays status information for the following components:

- Power
- Cooling and Temperature
- Memory
- Processors
- PCI Devices

## Management Processor

The Management Processor window displays a link to either the Remote Insight Lights-Out Edition Board Web pages or the Integrated Lights-Out hardware web pages. This information is provided by the Insight Management Agents. If no HP Web-Enabled System Management software is installed, then "None" displays.

The window also displays information about the following NIC components:

- Embeded NIC
- Integrated Lights-Out NIC

## NIC

The NIC displays information about the following networking components:

- Embeded NIC
- Virtual Interface

## Operating System

The Operating System window displays the following information about the operating environment:

- File system space used

- Logical Disks
- Processors
- Server
- Memory
- Network
- Physical Disks
- Processes
- Processor Utilization

## Storage

The Storage window displays the storage related information, this lists out the controller depending on the type of controller connected which may be any of the following types:

- IDE Controllers
- Drive array controllers
- External Array Storage Systems
- Fibre channel tape controller
- SCSI controllers
- SAS Host Bus Adapters

## System Configuration

The System Configuration window displays the following system related information:

- Automatic Server Recovery
- Security
- Software Version Info
- System Board
- System Resources
- System Summery

## Version Control

The Version Control window displays information about installed software, such as the name of the software and the version.

# Settings tab

The Settings tab provides you with the ability to access the agent options and define the Management HTTP Server security settings.
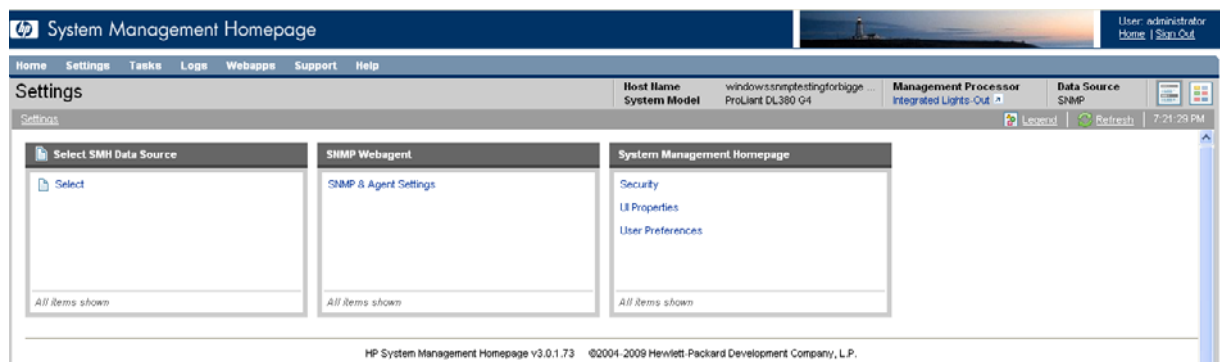


## Settings section

The Settings section provides a listing of participating agents. Each of the participating agents has options already defined.

## Select SMH Data Source

This section allows to set the data source type to WBEM or SNMP.

# SNMP Webagent

The HP Management Agents page is used to view and set the HP Management Agents configuration.

It allows settings for Server Role, Data Collection Interval, SNMP Sets and Remote Reboot settings.

If you make Management Agents Configuration changes, you must click the **Restart Agents** button for changes to the HP Management Agents (Server Agents, Foundation Agents, Storage Agents, and NIC Agents) settings to take effect on the server.

- **Server Role**—Displays the description of the system's role or function. You can also set the Server Role text on multiple devices by creating a Group Configuration Task in  Insight Manager 7.  To learn more about how to set the server role, see the *Insight Manager 7 Technical Reference Guide*.
- **Data Collection Interval**—Displays the time interval that the HP Management Agents collect the data from the server.
- **SNMP Sets**—Displays whether or not the SNMP Sets is enabled. When it is disabled, sets are not allowed by anyone.
- **Remote Reboots**—Displays whether or not a remote reboot of the server is allowed.

Wait until you have completed changing all of the settings before clicking the **Restart Agents** button. The page cannot be refreshed and changes cannot be made while the restart is occurring. After clicking the **Restart Agents** button, wait until the agents restart, and then refresh the page to view the updated information.
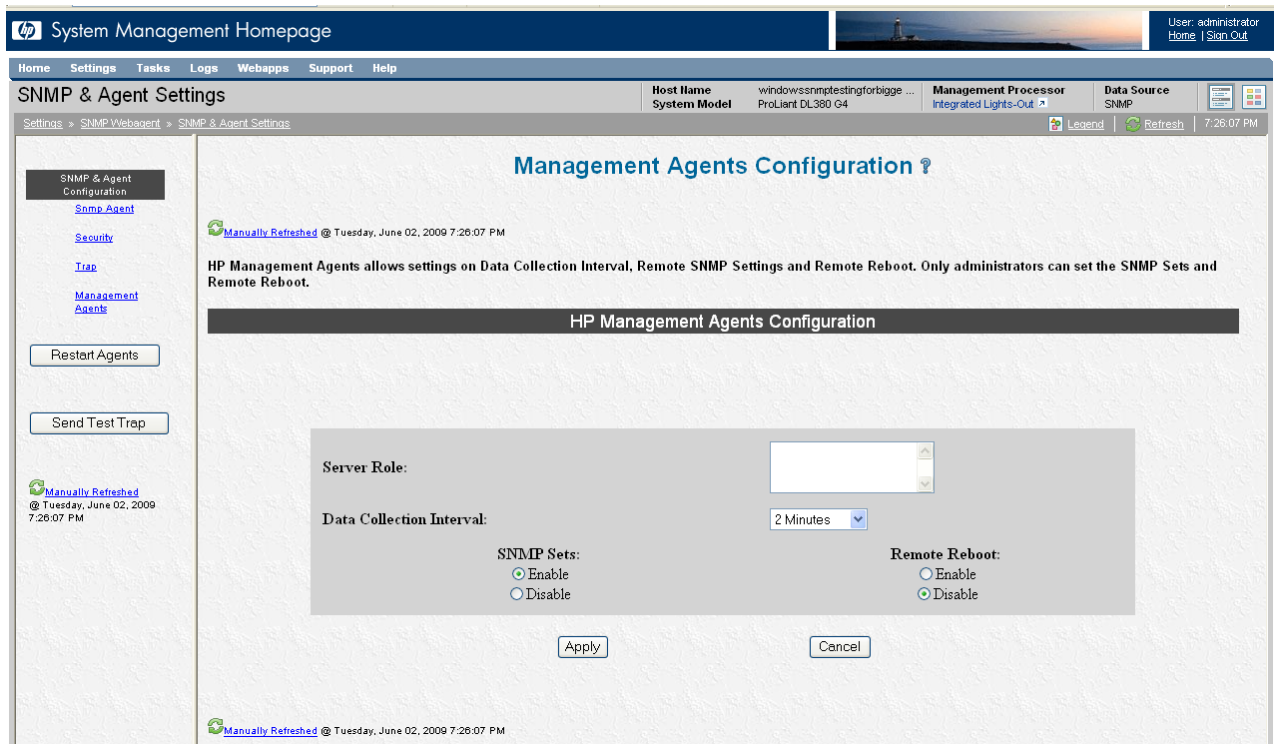
## Management HTTP Server section

The Management HTTP Server section provides links allowing you to configure your Management HTTP Server settings. The Management HTTP Server section provides links to:

- Security
- UI Properties
- User Preferences

## Security

Provides following options and also contains notes which describe the usage of the each of the option available and also procedure to set the values

- **Anonymous/Local Access** —When you check to allow Anonymous users access to unsecured pages, note that this include local users. When you turn on automatic logon in System Management Homepage, any user with access to the local console is granted full access if Administrator is selected, without being challenged for a username and password.
- **IP Binding** —Configure the System Management Homepage to only bind to IP addresses that match the subnet and mask values input in the left. The System Management Homepage always binds to the loopback (localhost/127.0.0.1). If IP Binding is enabled and no subnet/mask pairs are configured, then the System Management Homepage is only available in the localhost. Up to five subnet IP addresses and masks may be defined.
- **IP Restricted Login**—Type name, IP address or IP address range, and click the Add button. IP address ranges should be listed with the lower end of the range followed by a hyphen followed by the upper end of the range. All ranges are inclusive in that the upper and lower bounds are considered part of the range. IP address ranges and single addresses are separated by semi-colons. IP address ranges should be entered in the following format:
  192.168.0.1-192.168.0.255
- **Kerberos Authorization**—Users with Administrator access can view and set all information provided through the System Management Homepage. Users with Operator access can view and set most information provided through the System Management Homepage. Some web applications limit access to the most critical information to administrators only. Users with User access can view most information provided through the

System Management Homepage. Some web applications restrict viewing of critical information from individuals with User access.

- Local Server Certificate
  - **Current Certificate**—SMH allows setting a certificate with alternative names in addition to the Common Name (CN). Server names are separated by semi-colons without blank spaces. Any changes in Alternative Names here affect only the current certificate
  - **Create PKCS #10 Data**—The System Management Homepage can create Certificate Request (PKCS #10) data which can be sent to a Certificate Authority (CA) at a later time. This data is base64 encoded. The CA processes this request and return a response file (PKCS #7) which can be imported into the System Management Homepage. Use the top-left box to create the PKCS #10 Certificate Request data.

    The two following fields may be optionally specified. If not specified, they are automatically filled in with "Hewlett-Packard Company" for the Organization and "Hewlett-Packard Network Management Software (SMH)" for the Organizational Unit.

    SMH allows you to add alternative names to the Certificate Request, in addition to the Common Name (CN).
  - **Import PKCS #7 Data**—The System Management Homepage imports base64 encoded PKCS #7 data which a Certificate Authority returned based upon an earlier Certificate Request (PKCS #10). Cut-and-paste the PKCS #7 information into the text box in the left and press the button to import it into the System Management Homepage
- **Port 2301**—Option to enable port id : 2301
- **Timeouts**—Users with Administrator access can set the session timeout to between 1 and 60 minutes (the default value is 15 minutes). When a session timeout occurs, the user has to log in again.  Users with Administrator access can set the user interface timeout to between 10 and 3600 seconds (the default value is 20 seconds). This is the maximum amount of time the System Management Homepage waits for requested information
- **Trust Mode**—Other Trust Modes are considered less secure than certificate based trust modes. HP strongly recommends using Trust by Certificate. Trust by name have a limit of five allowed Server certificate names
- **Trusted Management Servers**—Certificates are used to establish the trust relationship between Systems Insight Manager or Insight Manager 7 and the System Management Homepage.  To add a certificate to the Trusted Certificates list: Select **Import Certificate Data** option, copy and paste the base64 encoded certificate into the text box and press the *Import* button. or Select **Add Certificate From Server** option, type *Server Name* into the text box and press **Add** button. The certificate information is presented for verification/confirmation before it is added to the list.
- **User Guides**—Users with Administrator access can view and set all information provided through the System Management Homepage.  The appropriate default user group (Administrators for Microsoft operating systems and root for Linux) always has administrative access.  Windows systems that are part of a domain may specify domain groups as well as local groups for any level of access.  Users with Operator access can view and set most information provided through the System Management Homepage. Some web applications limit access to the most critical information to administrators only.  Users with User access can view most information provided through the System Management Homepage. Some web applications restrict viewing of critical information from individuals with User access.

## UI Properties

You can change the default look for SMH components. Listview displays it as boxes with children items inside and iconview shows each item as an icon.

You can also change the order in which boxes and items in boxes are displayed. You may choose to display items either alphabetically or by status, in which case more critical items are listed first.

Enabling the use of custom imagery and warning text provides the ability to customize the sign in and header images as well as adding a small text in the sign in page.
For more information, see the `README.txt` file in the hpsmh/data/htdocs/custom_ui directory in the HP SMH install path.

You can change the default look for SMH components. Listview displays it as boxes with children items inside and iconview shows each item as an icon.

## User Preferences

You can change the look for SMH components for your user here. Listview displays it as boxes with children items inside and iconview shows each item as an icon.

You can also change the order in which boxes and items in boxes are displayed. You may choose to display items either alphabetically or by status, in which case more critical items are listed first.

## Tasks Tab

The Tasks tab displays links to task-oriented pages provided by participating HP Web-Enabled System Management software.

📝 **NOTE:** If the HP Web-Enabled System Management software provides no tasks, the Tasks tab is not visible.



## Logs tab

The Logs tab includes various log information like Integrated Management Log, HP Version Control Agent Log, Integrated Lights-Out Log, and System Management Homapage Log. Any logs contained in the installed HP Web-Enabled System Management software can be displayed on this tab. For example, if the Version Control Agent is installed, a link to the Version Control Agent log is displayed on the Logs page. You can access the entry point to the log shown by clicking the link.



## Webapps tab

The Webapps tab lists out all Webapps installed in SMH. Integrated agents are shown in the Home section only. Other agents can be opened here by clicking in the link with it's name.
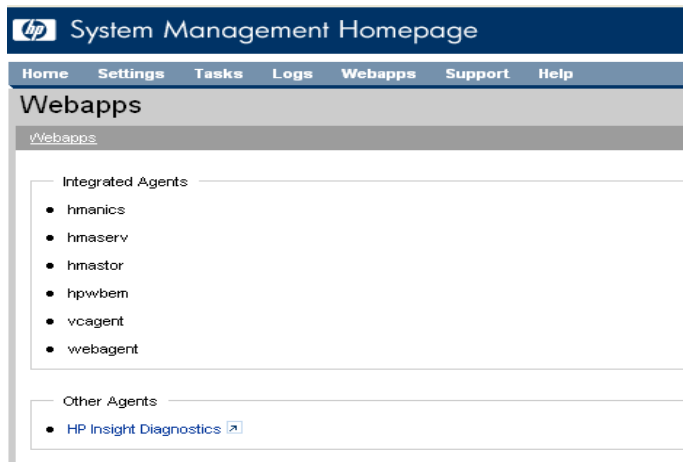
## Support tab

The Support tab contains of links to available support services like – ProLiant Essential Software Info, Integrity Essential Software Info, Support Links, and Forum links.

## Help tab

The Help tab contains information about the System Management Homepage infrastructure and its configuration and log pages. The rest of the entries in this column link directly to the help systems associated with the webapps installed in the system (that provide a help system).

# Replicating passwords and configuration data across multiple devices

If your enterprise has numerous devices and you want to share common passwords, configuration information, and certificates of trusted HP Systems Insight Manager servers, you can copy certain files from the desired device to the other devices.

To replicate the user passwords, replicate `\compaq\wbem\cpqhmmd.acl`

To replicate the Management HTTP Server configuration information, replicate the following:

`\compaq\wbem\homepage\cpqhmmd.ini`

`\compaq\wbem\homepage\cpqhmmdx.ini`

To replicate the certificates of the trusted HP Systems Insight Manager servers, replicate all files that exist in `\compaq\wbem\certs`

After the desired files have been replicated to a given device, the Management HTTP Server must be restarted for the changes to take affect.

# 2 Agent information

## Management Host agent

The Management Host agent gathers data for the HP Host OS MIB. This data includes:

- Server/host name and OS version number
- CPU utilization information (for each CPU) over 1-minute, 5-minute, 30-minute, and 60-minute intervals
- File system information (for each mounted file system)
- Software version information

## Running the host agent

### NetWare systems

Support for Desktop Intelligent Manageability provides a list of computers that have logged into the server running CPQHOST. CPQAGIN should be used to set up the server to run CPQHOST and support Desktop Management. CPQAGIN edits the system login script to include the execution of a discovery program (CPQCLNT.EXE). If the desktop logging into the server supports Desktop Management, the discovery program writes the desktop's system name, IP and/or IPX address, as well as other information to SYS:CPQDATA. CPQHOST then polls SYS:CPQDATA, reads any information from logged-in desktops, and adds that information to the list of logged-in desktops. Only desktops that support HP Desktop Management appears in the list supported by CPQHOST and Insight Manager.

#### Configuring client data collection

To set up the system to collect client data:

1. Load the Desktop Management Support files.
   - If you have selected Desktop Management during SmartStart setup or if you have installed Management Agents for Servers 2.60 or later, the Desktop Management Support files have already been copied to your system. At the system console prompt, enter the following command:
     LOAD CPQAGIN
   - If you have not installed Management Agents for Servers 2.60 or later, insert the Management CD into your CD-ROM drive. At the system console prompt, enter the following command:
     ```
     LOAD [CD DRIVE]:\AGENTS\NETWARE\ENG\COMPAQ\ CPQAGIN
     ```
     At the opening menu, select **Copy New NetWare Agents to System** and follow the onscreen instructions. Do not exit the installation program.
2. Select **Client Management** from the opening menu and follow the on-screen instructions.
3. To manage a workstation (client) that is logged in to a NetWare 4.x/IntranetWare 4.11 environment using a NetWare Directory Services (NDS) connection, add the following three lines to the container login script where the user ID resides:
   ```
   map ins s2:=sys:\public
   #cpqclnt.exe \\servername\SYS\PUBLIC
   map del s2:
   ```
After completing these instructions, Client Management is installed and configured on the system.

## Threshold Agent

The Threshold Agent is designed to provide support for HP Insight Manager user-defined thresholds. It also provides a generic way to set thresholds on objects in any HP SNMP MIB.

Users can set thresholds on counter or gauge MIB variables. Each selected MIB variable is periodically sampled by the Threshold Agent at a rate defined by the user.

MIB data values are compared to user-configured thresholds. If a configured threshold is exceeded, an alarm trap is sent to the configured SNMP trap destination and optionally to e-mail. User-configured alarm thresholds are saved in the data registry until the user deletes them.

For further information about setting thresholds, see the *HP Systems Insight Manager User Guide* help file.

# System Agent

## Software version information

The software version section displays the versions of the system software installed on this machine: BIOS, drivers, and agents.

This section also displays a string that specifies the version of HP Insight Management Agents running on the system.

## Cluster information

The cluster information section displays the overall status of a cluster. It also displays the state of the cluster service running on each node, as well as the worst-case status of the shared resources of each node.

Information about cluster nodes, resource groups, networks, interconnects, and software might appear.

## Cluster nodes

The cluster node section contains information about the systems that are members (nodes) of the cluster. This section displays the names of the nodes, status of the cluster service running on the nodes, and the status of the shared resources. The following cluster service status values are available:

- **Up**—The node is operating as an active member of a cluster. A node that is up can respond to updates to the cluster database, can host and manage groups, and can maintain communication with other nodes in the cluster.
- **Paused**—The node is operating as an active member of a cluster but cannot host any resources or resource groups. The node is up but cluster activity is paused. Nodes that are undergoing maintenance are typically placed in this state.
- **Joining**—The node is in the process of joining a cluster. This is a temporary state.
- **Down**—The node is trying to form or rejoin a cluster or is down. A node that is down is not an active cluster member and it might or might not be running. The Cluster Service might have started and then failed or might have failed to start.
- **Unknown**—An error has occurred and the exact state of the node could not be determined, or the node status is unavailable.

## Cluster resources groups

The Cluster Resources Groups section displays the cluster resources by resource group. The following information might appear:

- **Name**—Displays the name of the resource and the color status associated with the resource state.
- **State**—Displays the current state of the resource, which can be one of the following:
  - **Online**—The resource is online and functioning normally.
  - **Offline**—The resource is offline.
  - **Online pending**—The resource is in the process of coming online.
  - **Offline pending**—The resource is in the process of going offline.
  - **Failed**—The resource has failed.
  - **Unknown**—The resource has not responded and the exact state is undetermined.
- **Type**—Displays the resource type, which is acquired from the cluster service.
- **Owner**—Displays the name of the node in the cluster that currently owns this resource.
- **Identification**—Displays information based on the resource type. If the type is Physical Disk, identification displays the drive letter, the physical identification, and the logical drive number. For disks, this is the physical ID entered at the server for this disk or the serial number if nothing was entered. If the type is IP Address, then the IP address appears. Any other resource type displays N/A.

## Cluster networks

The Cluster Network section displays the following information about the networks connected to the cluster nodes:

- **Name**—Displays the name of the network.
- **Role**—Displays how the network is used for communication by the cluster, which can be one of the following:
  - **Internal**—The network is used for internal cluster communication.
  - **Client**—The network is used to connect client systems to the cluster.

- **Client/Internal**—The network is used to connect client systems and for internal cluster communication.
- **None**—The network is not used by the cluster for communication.
- **State**—Displays the current state of the network, which can be one of the following:
  - **Online**—The network is online and functioning normally.
  - **Offline**—The network is offline.
  - **Partitioned**—The network is operational, but two or more nodes on the network cannot communicate. Typically, a path-specific problem has occurred.
  - **Unavailable**—The network is unavailable to the cluster because the role of the network is None.
  - **Unknown**—The network has not yet responded and the exact state is undetermined.
- **Address Mask**—Displays the address mask used by the network in the format specified by the transport type.
- **Description**—Displays the text network description if one was entered.

## Cluster interconnect

The Cluster Interconnect section displays the following information about the adapters used for cluster interconnections:

- **Network**—Displays the name of the network.
- **Address**—Displays the address used by the interconnect in the format specified by the transport type.
- **Transport**—Displays the network transport protocol used by the interconnect.
- **Node**—Displays the name of the system in which the adapter is installed.
- **Physical ID**—Displays the physical identification of the interface card including the name, the slot number, and base I/O address, if available.

## Cluster software

The Cluster Software section displays the file name, version number, and description of the HP Insight Management Agents cluster software.

# Sub system Classification

## Power Subsystem

This section displays information about the redundant power supplies. The following entries may be displayed:

- **Location**—Displays the bay where the power supply is located.
- **Condition**—Displays the status of the power supply. The following values are possible:
  - **OK**—A power supply is installed and operating normally.
  - **Failed**—A power supply is installed and is no longer operating. Replace the power supply.
  - **Not Installed**—Nothing is installed in this power supply bay.
  - **Unknown**—The Server Agent is unable to determine if this storage system power supply bay is occupied.
- **Serial Number**—Displays the serial number of the power supply. This information can be used for identification purposes.
- **Firmware Revision**—Displays the firmware revision of the power supply.
- **Present**—Represents whether the power supply is present in the chassis.
- **Status**—Represents the status of the power supply in the chassis. The following values are possible:
  - No Error
  - General Failure
  - Bist Failure
  - Fan Failure
  - Temperature Failure
  - Interlock Open
  - EPROM Failed
  - VREF Failed
  - DAC Failed
  - RAM Test Failed
  - Voltage Channel Failed

- Orring Diode Failed
- Brownout
- Give Up On Startup
- NVRAM Invalid
- Calibration Table Invalid
- If the power supply is absent, the status is "Not Applicable"
- **Used Capacity (%)**—Represents the current power supply capacity which is a percentage of its maximum capacity.
- **Used Capacity (W)**—Represents the current power supply capacity in watts.
- **Max Capacity**—Represents the maximum capacity of the power supply in watts.
- **Model**—Represents the power supply model name.
- **Voltage**—Represents the Input Main Voltage of the power supply in volts.
- **Redundancy State**—Represents the redundancy state of the power supply. The following values are possible:
  - Redundant
  - Not Redundant
  - Unknown
- **Hot Pluggable**—Represents if the power supply is capable of being removed and/or inserted while the system is in an operational state. The following values are possible:
  - Hot Plug
  - Non-hot-plug
  - Unknown
- **Power Meter Information**—Current power meter reading value shows the most recent power reading.

# Cooling and temperature

This section displays details on the device environment. The following information is available.

## System Information

- **Degraded Action**—Allows you to designate what action is taken when the device environment becomes degraded. The options are:
  - **Continue**—The health or wellness driver signals the operating system to continue functioning in situations where the temperature is too high or too low. In more serious temperature situations, the device shuts down automatically.
  - **Shut Down**—The health or wellness driver signals the operating system to shut down in situations where the temperature is too high or too low. In more serious temperature situations, the device shuts down automatically.
  - **Unknown**—You may need to upgrade your driver software or Server Agents or the Server Agent cannot determine the status of the device.
- **Overall Thermal and Fan Status**—Displays the overall condition of the system's thermal environment. The options are:
  - **Failed**—If the thermal temperature status or thermal CPU fan status or thermal System fan status is failed
  - **Degraded**—If the status is not failed and thermal temperature status or thermal CPU fan status or thermal System fan status is degraded
  - **OK**—If the thermal temperature status and thermal CPU fan status and thermal System fan status are all OK
  - **Unknown**—The thermal features are not supported.

## Temperature Sensors Information

- **Temperature condition**—Displays the current temperature condition of the system or client PC. This value can be:
  - **OK**—The temperature is within normal operating range.
  - **Degraded**—The temperature is above normal for airflow obstructions. Make sure that the cover is on.

⚠ **CAUTION:** Do not operate the system with the cover removed. Proper airflow is possible only when the cover is in place and properly secured..

- **Failed**—The temperature is outside the normal operating range and could permanently damage the system. The system automatically shuts down to prevent damage to hardware or data loss.

📝 **NOTE:** A Failed condition does not occur in a client PC since the power supply for the client is cut off if thermal condition reaches a permanently damaging level.

- **Unknown**— If the Server Agents or the Server Agent cannot determine the status of the device, you may need to upgrade your driver software. If you are managing a client with an unknown temperature status, the client may not support thermal detection.
- **Sensor**—The number that uniquely specifies the temperature sensor description.
- **Location**—This specifies the location of the temperature sensor present in the system.
- **Temperature**—This is the current temperature sensor reading in degrees celsius.
- **Threshold**—This is the shutdown threshold temperature sensor setting in degrees celsius. This is the temperature at which the sensor is considered to be in a failed state causes the system to be shutdown.

📝 **NOTE:** Only the Ambient zone type allows setting of the threshold temperature. Not all (maybe one or none) sensors can set this value.

- **Type**—This specifies the type of this instance of temperature sensor. This value can be:
  - **Blowout**—If a blowout temperature sensor reaches its threshold, the fan or fans in the area of the temperature sensor increases in speed in an attempt to reduce the temperature before a caution or critical threshold is reached.
  - **Caution**—If a caution temperature sensor reaches its threshold, the temperature condition is set to degraded and the system either continues or shuts down depending on the setting of the Thermal Degraded Action.
  - **Critical**—If a critical temperature sensor reaches its threshold, the Temperature Condition is set to failed and the system shuts down.
  - **Unknown**—The Temperature threshold type could not be determined.

## Fault Tolerant Fans Information

This section displays an entry for each of the device or system processor fans.

The status of each fan can be the following:

- **OK**—The fan is operational.
- **Degraded**—A redundant fan is not operating properly.
- **Failed**—A non-redundant fan has failed. The device shuts down automatically to prevent damage to hardware or data loss. Replace the fan.
- **Unknown**—You may need to upgrade your driver software or Server Agents and the Server Agent cannot determine the status of this setting.
- **Fan**—The number that uniquely specifies the fault tolerant fan description.
- **Location**—This specifies the location of the fault tolerant fan present in the system.
- **Type**—This specifies the type of the fan. This value can be:
  - **tachOutput**—The fan can increase speed for greater cooling. Implies spin detect.
  - **spinDetect** —The fan can detect when the fan stops spinning.
  - **Unknown**—The type of fan could not be determined.
- **Present**—This specifies if the fault tolerant fan is present in the system.
- **Hot Pluggable**—This indicates if the fan is capable of being removed and/or inserted while the system is in an operational state. If the value is hot pluggable, the fan can be safely removed if the Redundant State field is set to redundant.
- **Speed**—This specifies the speed of the fault tolerant fan.
- **Redundancy State**—This specifies if the fan is in a redundant configuration.

## Memory

Device memory information is listed below:

- **Total Memory** [KB] is the total amount of memory available on the device or client PC, such as 8192 KB.
- **Correctable Memory**—Memory errors are corrected by the Error Correcting Code (ECC) memory subsystem when they occur. The Correctable Memory field displays the status of the Correctable Memory as one of the following:
  - **Logging** —ECC memory correction is supported and error logging is enabled.

- **Disabled**—ECC memory correction is supported, but errors are not logged for this device.
- When a certain rate of errors is exceeded the health driver automatically disables logging of these errors, and sends an alarm. The errors are corrected, but are no longer logged. Logging is re-enabled when the driver is reloaded or the operating system restarts.
- **Not Supported**—Logging of correctable memory errors is not available for this device. Either the device does not support ECC memory or the driver is not loaded.
- **Unknown**—You may need to upgrade the driver software and/or Server Agents. The Server Agent cannot determine the status of the devices.

## Advanced Memory Protection (AMP)

This section displays the following information about the Advanced Memory Protection sub-system.

- **AMP Mode Status**—Displays status of the Advanced Memory Protection sub-system. The following states are supported:
  - **Other / Unknown**—The system does not support Advanced Memory Protection or the Management Agent cannot determine the status.
  - **Not Protected**—This system supports Advanced Memory Protection but the feature is disabled.
  - **Protected**—The system supports Advanced Memory Protection. The feature is enabled but not engaged.
  - **Degraded**—The system was protected, but the Advanced Memory Protection has been engaged; therefore Advanced Memory Protection is no longer available.
  - **DIMM ECC**—The system is protected via DIMM ECC only.
  - **Mirroring**—The system is protected by Advanced Memory Protection in the mirrored mode.   No DIMM faults have been detected.
  - **Degraded Mirroring**—The system is protected by Advanced Memory Protection in the mirrored mode. One or more DIMM faults have been detected.
  - **Online Spare**—The system is protected by Advanced Memory Protection in the Online Spare mode.   No DIMM faults have been detected.
  - **Degraded Online Spare**—The system is protected by Advanced Memory Protection in the Online Spare mode.   One or more DIMM faults have been detected.
  - **RAID-XOR**—The system is protected by Advanced Memory Protection in the RAID-XOR memory mode.   No DIMM faults have been detected.
  - **Degraded RAID-XOR**—The system is protected by Advanced Memory Protection in the RAID-XOR memory mode.   One or more DIMM faults have been detected.
  - **Advanced ECC**—The system is protected by Advanced Memory Protection in the Advanced ECC mode.
  - **Degraded Advanced ECC**—The system is protected by Advanced Memory Protection in the Advanced ECC mode.   One or more DIMM faults have been detected.
  - **LockStep**—The system is protected by Advanced Memory Protection in the LockStep mode.
  - **Degraded LockStep**—The system is protected by Advanced Memory Protection in the LockStep mode.   One or more DIMM faults have been detected.
- **AMP Mode Available**—Displays the options available:
  - **RAID-XOR**—This system can be configured for Advanced Memory Protection using the RAID-XOR engine.
  - **Dual Board Mirroring**—This system can be configured for Mirrored Advanced Memory Protection within a dual memory board configuration. The mirrored memory may be swapped with memory on the same memory board or with memory on the second memory board.
  - **Single Board Mirroring**—This system can be configured for Mirrored Advanced Memory Protection within a single memory board.
  - **Advanced ECC**—This system can be configured for the Advanced ECC type of Advanced Memory Protection
  - **Mirroring (deprecated)**—This system can be configured for Mirrored Advanced Memory Protection
  - **Online Spare**—This system can be configured for Online Spare Advanced Memory Protection.
  - **LockStep**—This system can be configured for LockStep Advanced Memory Protection.
  - **None**—This system can not be configured for Advanced Memory Protection.
- **Configured AMP Mode**—Displays the currently active type of Advanced Memory Protection based on the types available. The following connection states are supported:
  - **None \ Unknown**—The Management Agent cannot determine the Advanced Memory protection fault tolerance or system is not configured for AMP. You may need to upgrade your software.
  - **Online Spare**—A single spare bank of memory is set-aside at boot time. If enough ECC errors occur, the spare memory is activated and the memory experiencing the errors is disabled.

- **Mirroring**—This system is configured for Mirrored Memory Protection. All memory banks are duplicated in Mirrored Memory, as opposed to only one for Online Spare Memory. If enough ECC errors occur, the spare memory is activated and the memory experiencing the errors is disabled.
- **RAID-XOR**—This system is configured for Advanced Memory Protection using the XOR engine.
- **Advanced ECC**—This system is configured for Advanced Memory Protection using the AdvancedEcc engine.
- **LockStep**—This system is configured for Advanced Memory Protection using the LockStep engine.

## Memory Summary

This section displays the information about the memory board or riser detail information.

- **Condition**—Displays the current condition of the Advanced Memory Protection subsystem. The following states are supported:
  - **Other**—The system does not support fault tolerant memory or the Management Agent cannot determine the state.
  - **Ok**—This system is operating normally.
  - **Degraded**—The Advanced Memory Protection sub-system has been engaged. Schedule server down time to replace the deactivated memory.
  - **Location**—The Slot/CPU number in which the memory board or cartridge or riser is installed.
  - **System Board**—There is no seperate memory board slot, all DIMMs are installed on system board itself.
  - **Board Number**—There is memory board slot available, all DIMMs are installed on the memory board.
  - **CPU Number**—This displays the CPU number to which the memory DIMMs are installed.
  - **Riser Number**—This displays the riser number to which the memory DIMMs are installed.
- **Status**—This provides the current status of the Advanced Memory Protection memory board or cartridge or riser. The following status values are supported:
  - **Unknown**—The value is unsupported or could not be determined.
  - **OK**—The board or cartridge is configured and operating correctly.
  - **Correctable Memory Error**—The board or cartridge has at least one DIMM ECC error.
  - **Unlock Error**—The board or cartridge is unlocked when it should not be. Be sure that the board of cartridge is locked.
  - **Configuration Error**—The board or cartridge has a bad memory configuration. Be sure that all memory modules are of the correct type, speed, latency, etc.
  - **Bus Error**—The board or cartridge has a memory bus error. Please insure all memory modules are of the correct type, speed, latency, etc. Be sure that the cartridge is inserted properly.
  - **Power Error**—The board or cartridge has power error. Please insure all memory modules are of the correct type,speed, latency, etc. Also insure the cartridge is inserted properly.
  - **Advanced ECC**—The board or cartridge is configured for advanced ECC mode.
  - **Online Spare**—The board or cartridge is configured for Online Spare mode.
  - **Mirrored**—The board or cartridge is configured for mirrored mode.
  - **Uncorrectable Memory Error**—The board or cartridge has a mirrored/RAID DIMM error.
  - **Memory RAID**—The board or cartridge is configured for memory RAID mode
  - **LockStep**—The board or cartridge is configured for LockStep mode.
  - **Uncorrectable LockStep Memory Error**—The board or cartridge has a LockStep DIMM error.
  - **Present**—This value specifies existense of the board or cartridge or riser in the Slot/CPU number.
  - **Locked**—This value specifies whether the board or cartridge or riser is locked or not.
  - **Hot Plug**—This value specifies whether the board or cartridge or riser is hot pluggable or not.
  - **Total Memory**—This value specifies the size of memory for this board or cartridge or riser, including memory seen by the OS and the memory used for spare, mirrored, RAID-XOR, or LockStep configurations.
  - **In Use by OS**—This value specifies the size of memory for this board or cartridge or riser as seen by the OS.

## Memory Details

- **Condition**—Displays the condition of the memory module.
- **Socket**—Displays the socket number of memory module.
- **Status**—Displays the status of memory module whether in use or not.
- **Type**—Displays the type of memory installed.

- **Other**—Memory type can not be determined.
- **Board**—The value determine the memory module is permanently mounted (not modular) on a system board or memory expansion board.
  - CPQ Single Width Module
  - CPQ Double Width Module
  - SIMM
  - PCMCIA
  - Compaq Specific
  - DIMM
  - Small Outline DIMM
  - RIMM
  - SRIMM
  - DDR2 FB-DIMM
  - Size - Displays the Size of the memory Module in Mega Bytes.
  - Technology - Displays the technology of Memory Module.
  - Unknown - Memory Technology can not be determined.
  - Fast Page
  - EDO
  - Burst EDO
  - Synchronous
  - RDRAM

## Processors

The following information about each processor in the system is available in this window. This information may vary depending on device type.

- **Processor**—Lists the type of processor and its speed. For devices, the colored ball indicates the status of each processor.
- **Co-processor**—Displays the type and speed of the coprocessor on the device or client PC, such as 80387 at 33 MHz, or W 3167 at 33 MHz.
- **Slot**—Lists the number of the slot where the processor is installed. Use this information for identification purposes.
- **Slot 0**—Indicates that a CPU or a memory module is connected directly to the system board and not in an expansion board.
- **Socket**—Displays the currently selected processor's socket. Use this information for identification purposes.
- **Cache**—Displays the amount of device or client hardware cache available. For example, Cache L2: 64KB indicates 64 KB of secondary level cache between the processor and system memory.
- **Action**—Indicates what action, if any, should be taken for the currently selected processor. Possible values include No Action Needed and Replace CPU.
- **Step**—Displays the revision level of the processor.
- **Cores**—Indicates the number of cores present in this processor
- **Threads**—Indicates the number of threads present in this processor
- **Hyper-Thread**—Indicates whether hyper-threading is enabled or disabled. When Hyper-Threading is enabled, a single processor acts as two logical processors and the OS views it as two processors.

## PCI Devices

This section displays a list of expansion boards and their associated slot numbers. You can also view System Resources that are used by each board. Use the Expansion Boards feature to keep track of boards on the device and which resources are being used.

The Expansion Boards section provides additional information about PCI slots in the system, such as the width and speed of the PCI slot.

# Management Processor

## Integrated Lights-Out (iLO) NIC

The NIC section displays the following information about the NIC in the iLO. Not all fields are supported by all models of Remote Insight Board and/or NIC.

- **Model**—Displays the NIC model.
- **DNS Name**—Displays the fully qualified DNS name assigned to this iLO.
- **Type** displays if the NIC is embedded or pcmcia and whether it is ethernet or token ring.
- **IP Address**—Displays the IP address for this NIC.
- **Subnet Mask** displays the subnet mask for this NIC.
- **Gateway**—Displays the default gateway configured for this NIC.
- **Status**—Displays if this NIC is enabled or disabled.
- **Physical Address**—Displays the MAC address for this NIC.
- **Duplex**—Displays if the controller is in half duplex, full duplex or does not support a duplex state.
- **Link Status**—Displays Remote Insight/Integrated Lights-Out Network Interface Controller condition. The following values are possible:
  - Other
  - Ok
  - Degraded
  - Failed
- **Speed**—Displays the speed of the NIC.
- **Max Packet Size**—Displays the maximum packet size of the NIC.
- **Transmit/Receive Statistics**—Displays the following set of statistics for the NIC:
- **Bytes**—Displays the number of bytes transmitted/received.
- **Total Packets**—Displays the number of packets transmitted/received.
- **Unicast Packets**—Displays the number of unicast packets transmitted/received.
- **Non-Unicast Packets**—Displays the number of non-unicast packets transmitted/received.
- **Discarded Packets**—Displays the number of packets discarded during transmit/receive.
- **Error Packets**—Displays the number of error packets found during transmit/receive.
- **Unknown Protocols**—Displays the number of unknown protocol packets received.
- **Queue Length**—Displays the number of outstanding packets in the transmit queue.

## Integrated Lights Out

- **Model**—Displays the edition of the iLO in the server.
- **Hardware Version**—Displays the Hardware revision of iLO model on the server.
- **Serial Number**—Displays the iLO serial number.
- **Firmware Version**—Displays the iLO firmware version and date.
- **Active License Type**—Displays the iLO license type actived.
- **License Key** displays the activated iLO license key.
- **iLO Security Override Switch**—Displays the Integrated Lights-Out security state.  The iLO Security Override Switch field is supported only in case of Integrated Lights-Out models.
- **Mouse**—Displays whether the mouse is connected to Remote Insight Board. The Mouse field is not supported for Remote Insight Lights-Out models.
- **Keyboard**—Displays whether the keyboard is connected to Remote Insight Board.  The Keyboard field is not displayed for Remote Insight Lights-Out models.
- **Interface Status**—Displays the iLO interface status.

## Alarm

If your system supports Remote Insight Lights-Out Edition, the following alerts are available:

- **Status**—Indicates if alerts are enabled at the iLO. This is a global flag and governs all users. If alerts are disabled, alarms are not sent.

- **Pending Alarm**—Displays if the alert is unable to determine the state of the iLO, or if all alerts have been delivered or if there are alerts pending that still need to be sent.

If your system supports the Integrated Lights-Out Edition, the following alerts are available:

- **Remote Insight Alerts**—Allow users to enable or disable the alerts by clicking the button.
- **Host Alerts** allow users to enable or disable the alerts by clicking the button.
- **Pending Alarm**—Displays if the alert is unable to determine the state of the Remote Insight, or if all alerts have been delivered or if there are alerts pending that still need to be sent

## Battery

- **Battery Status**—Indicates the status of the Remote Insight board battery. When the Remote Insight board battery is enabled and there is a host power failure, the Remote Insight board battery provides a minimum of 30 minutes of operation. This enables the Remote Insight board to send alerts to the users that were specified during configuration.
- **Battery Condition**—Displays the condition of the battery. The following values are possible:
  - **OK**—The battery is charged and functional.
  - **Failed**—The battery needs to be replaced.
  - **Disconnected**—The battery has been disconnected.
- **Battery Charge**—Displays the percentage of the charge in the Remote Insight board battery.

## Power

- **Auxiliary Power**—Displays whether or not the auxiliary power  (External Power Cable and/or Internal Power Cable, which is a 30-pin cable or a 16-pin cable) is connected to the Remote Insight.
- **Virtual Power Button**—Displays whether or not the virtual power button cable is connected to the Remote Insight.

## Modem/COM Port Settings

📝 **NOTE:**  The Modem/COM Port Settings is not supported for Integrated Lights-Out Edition or The Remote Insight Lights Out Edition.

A series of tables is displayed providing information about any Remote Insight Board modems or communication ports. The first table title indicates the type of device described like "Internal Modem", "External Port", "External Modem", "External Direct Connect," or "External XonXoff". The tables may contain the following:

- **Model**—Displays the model of the communication device.
- **Data Settings**—This table contains the data settings for the communication device including:
  - **Alarms**—Displays if the Remote Insight firmware uses this communication device to deliver traps.
  - **Non-PPP**—Displays if non-PPP connections are allowed on this port.
  - **Baud Rate**—Displays the baud rate to be used on this port.
  - **Data Bits**—Displays the number of data bits to be used on this port.
  - **Stop Bits**—Displays the number of stop bits to be used on this port.
  - **Parity**—Displays the type of parity to be used on this port.
  - **Pager Settings**—Displays pager settings for the communication device.
  - **Alarms**—Displays if the Remote Insight Board firmware uses this port to deliver pages.
  - **Message**—Displays the message that appears in the body of the page.
  - **Baud Rate**—Displays the baud rate to use for pager messages.
  - **Data Bits**—Displays the number of data bits to user for pager messages.
  - **Stop Bits**—Displays the number of stop bits to use for pager messages.
  - **Parity**—Displays the type of parity to user for pager messages.
- **Modem Control Strings**—This table contains the modem control strings for the communication device including the following:
  - **Reset**—Displays the string used to reset the modem.
  - **Initialize**—Displays the string used to initialize the modem.
  - **Dial Prefix** —Displays the string pre-pended to phone numbers before dialing.

## Self Test Results

The Self Test Results section indicates various error-status depending on the Remote Insight model.  The following is the list of error-status fields:

- Busmaster I/O Reads
- Memory
- Internal Modem Firmware
- Internal Modem
- External Port
- Keyboard Interface
- Battery Interface
- NVRAM Interface
- NVRAM Write/Read/Verify
- Video SideCard
- PCMCIA
- NIC
- Mouse
- CPLD
- SRAM
- EEPROM
- I2C
- Boot Block
- Thread Initialization
- Rack Infrastructure
- Reset Integrated Lights-Out (iLO)

    The Reset Remote Insight button is used to Reset the Remote Insight Board.  Once the Remote Insight is reset, The HP Insight  Management Agents takes a minimum of two minutes to reconnect with the Remote Insight depending upon the poll interval.

# Operating System

## File System Space Used

Select the **File System Space Used** entry from the Mass Storage list to display the name of each volume, the number of megabytes used by that volume out of the total available, the number of megabytes unused by that volume, the total number of megabytes available, and the percentage of total space used. If disk space thresholds are set for any of the volumes, they are represented by arrows at the top of the disk space usage bar graph.

### Disk Space Usage Bar Graph

The bar graph uses a color code to indicate disk space status. The bar is blue if the disk space usage is at or below the warning and critical thresholds or if no thresholds have been set for the volume. The bar is yellow if the disk space usage is above the warning threshold and below the critical threshold. The bar is red if the disk space usage is above the critical threshold. The unused space on the volume is displayed in gray.

### Disk Space Usage Thresholds

The disk space usage threshold values are displayed inside triangular shaped indicators above the disk space usage bar graph. A yellow indicator is used for the warning threshold and a red indicator is used for the critical threshold. If the indicator is gray, then a threshold has not been created for this volume, or the threshold has been disabled.

### Resetting and Saving Thresholds

If you have security access to create, modify, or delete thresholds, two buttons display at the end of the page:

- Reset to Original Values
- Save Thresholds

If there is more than one volume, a Synchronize thresholds for all volumes checkbox displays. Select the checkbox to set all critical thresholds to the highest critical threshold value, and to set all warning thresholds to the highest warning threshold value. If you change one threshold, the same threshold on all of the other volumes automatically change to the same value.

Select **Reset to Original Values** to return to the original threshold values, or the values from the last time the thresholds were saved. This option also clears the Synchronize thresholds for all volumes checkbox so that thresholds can be set individually.

Select **Save Thresholds** to save any thresholds that have been modified and delete any disabled thresholds.

### Creating Thresholds

To create a threshold, select the gray threshold indicator with the left mouse button, holding the button down and dragging the indicator to the right until you reach the appropriate value. The threshold value displayed in the indicator changes as you are dragging. Release the mouse button.

Select **Save Threshold** to create the threshold with the displayed value.

### Modifying Thresholds

To modify a threshold, select the threshold indicator with the left mouse button, holding the button down, and drag the indicator to the right until you reach the appropriate value. The threshold value displayed in the indicator changes as you are dragging. Release the mouse button.

**NOTE:** If the indicator moves below 6 percent, it changes to gray to indicate that it is disabled. When you save the thresholds, disabled thresholds are deleted. A critical threshold can never go above 99 percent, or lower than a warning threshold plus 3 percent. Therefore, if the warning threshold is 85 percent, the valid range for the critical threshold is 88 percent to 99 percent. A warning threshold can never be higher than the critical threshold minus 3 percent. Therefore if the critical threshold is 95 percent, the valid range for the warning threshold is 6 percent to 92 percent.

### Deleting Thresholds

To delete a threshold, select the threshold indicator with the left mouse button, holding the button down, and drag the threshold indicator to the left until the indicator turns gray.

When you save the thresholds, disabled thresholds are deleted.

## Logical Disk Space

- **Volume**—Name of the logical drive for which statistical information is gathered.
- **Free Space (MB)**—Unallocated space on the disk drive in megabytes. One megabyte equals 1,048,576 bytes.
- **Free Space %**—Ratio of the free space available on the logical disk unit to the total usable space provided by the selected logical disk drive.
- **Queue Length**—Average number of both read and write requests that were queued for the selected disk during the sample interval.
- **Disk Busy Time % (Thresholds Supported)**—Percentage of elapsed time that the selected disk drive is servicing read or write requests.

## Processors

- **CPU**—Name of the processor for which statistical information is gathered.
- **Interrupts/sec**—Average number of hardware interrupts the processor is receiving and servicing in each second. It does not include Deferred Procedure Calls or DPCs, which are counted separately. This value is an indirect indicator of the activity of devices that generate interrupts, such as the system clock, the mouse, disk drivers, data communication lines, network interface cards, and other peripheral devices. These devices normally interrupt the processor when they have completed a task or require attention. Normal thread execution is suspended during interrupts. Most system clocks interrupt the processor every 10 ms, creating a background of interrupt activity. This counter displays the difference between the values observed in the last two samples, divided by the duration of the sample interval.
- **% User CPU Time**—Percentage of non-idle processor time spent in user mode. (User mode is a restricted processing mode designed for applications, environment subsystems, and integral subsystems. The alternative, privileged mode, is designed for OS components and allows direct access to hardware and all memory. The OS switches application threads to privileged mode to access operating system services.) This counter displays the average busy time as a percentage of the sample time.
- **% Privileged CPU Time**—Percentage of non-idle processor time spent in privileged mode. (Privileged mode is a processing mode designed for operating system components and hardware-manipulating drivers. It allows direct access to hardware and all memory. The alternative, user mode, is a restricted processing mode designed for applications, environment subsystems, and integral subsystems. The operating system switches application threads to privileged mode to access operating system services.) % Privileged CPU Time includes time servicing

interrupts and DPCs. A high rate of privileged time might be attributable to many interrupts generated by a failing device. This counter displays the average busy time as a percentage of the sample time.

- **% DPC Time**—Percentage of time that the processor spent receiving and servicing deferred procedure calls (DPCs) during the sample interval. DPCs are interrupts that run at a lower priority than standard interrupts. % DPC Time is a component of % Privileged Time because DPCs are executed in privileged mode. They are counted separately and are not a component of the interrupt counters. This counter displays the average busy time as a percentage of the sample time.
- **% Interrupt Time**—Percentage of time the processor spent receiving and servicing hardware interrupts during the sample interval. This value is an indirect indicator of the activity of devices that generate interrupts, such as the system clock, the mouse, disk drivers, data communication lines, network interface cards and other peripheral devices. These devices normally interrupt the processor when they have completed a task or require attention. Normal thread execution is suspended during interrupts. Most system clocks interrupt the processor every 10 milliseconds, creating a background of interrupt activity. This counter displays the average busy time as a percentage of the sample time.
- **% CPU Time (Thresholds Supported)**—Percentage of time that the processor is executing a non-idle thread. Designed as a primary indicator of processor activity, this counter is calculated by measuring the time that the processor spends executing the thread of the idle process in each sample interval, and subtracting that value from 100%. Each processor has an idle thread, that consumes cycles when no other threads are ready to run. It can be viewed as the percentage of the sample interval spent doing useful work. This counter displays the average percentage of busy time observed during the sample interval. It is calculated by monitoring the time, the service was inactive, and then subtracting that value from 100%.

## Server

### System Health

- **System Up Time**—Elapsed time (in seconds) that the computer has been running since it was last started. This counter displays the difference between the start time and the current time.
- **Total Threads**—Number of threads in the computer at the time of data collection. This count is an instantaneous count, not an average over the time interval. A thread is the basic executable entity that can execute instructions in a processor.
- **Context Switches/sec**—Combined rate at which all processors on the computer are switched from one thread to another. Context switches occur when a running thread voluntarily relinquishes the processor, is pre-empted by a higher priority ready thread, or switches between user mode and privileged (kernel) mode to use an executive or subsystem service. The context switches/sec rate for all threads running on all processors in the computer is measured in numbers of switches. Context switch counters on the system and thread objects display the difference between the values observed in the last two samples, divided by the duration of the sample interval.
- **Processor Queue Length**—Number of threads in the processor queue. There is a single queue for processor time even on computers with multiple processors. Unlike the disk counters, this counter counts ready threads only, not threads that are running. A sustained processor queue of greater than two threads generally indicates processor congestion. This counter displays the last observed value only; it is not an average.
- **Total Processes**—Number of processes in the computer at the time of data collection. This count is an instantaneous count, not an average over the time interval. Each process represents the running of a program.
- **% Registry Usage** —Percentage of the Total Registry Quota Allowed that is currently being used by the system. This counter displays the current percentage value only; it is not an average.

### Security

- **Access Permission Errors**—Number of times opens on behalf of clients has failed with STATUS_ACCESS_DENIED. This object can indicate random attempts to access files that are not properly protected.
- **Access Granted Errors**—Number of times access to files opened successfully were denied. This object can indicate attempts to access files without proper access authorization.
- **Server Logon Errors**—Number of failed logon attempts to the server. This object can indicate whether the password guessing programs are being used to violate the security on the server.
- **Server Sessions Errored-Out**—Number of sessions that have been closed because of unexpected error conditions or sessions that have reached the auto-disconnect timeout and have been disconnected normally.

### Server Utilization

- **(Network Utilization) Total Bytes/sec**—Total bytes per second that aserver has sent to and received from the network. This value provides an overall indication of how busy the server is.
- **Server Sessions**—Number of sessions currently active in the server. This object indicates current server activity.

- **Context Block Queue/sec**—Rate per second at which the work context blocks must be placed on the FSP queue of the server to await server action.
- **% Total PageFile Usage (Thresholds Supported)** —Amount in percent of the Page File instance in use. For details, see the Process Object: Page File Bytes information.

## Memory

- **Available KBytes** —Amount of physical memory available to processes running on the computer. It is calculated by summing space on the Zeroed, Free, and Stand-by memory lists. Free memory is ready for use. Zeroed memory is memory filled with zeros to prevent later processes from seeing data used by a previous process. Standby memory is memory removed from a working set (its physical memory) of a process in route to a disk, but is still available to be recalled. This counter displays the last observed value only; it is not an average.
- **Pages/sec**—Number of pages read from or written to disk to resolve hard page faults. Hard page faults occur when a process requires code or data that is not in its working set or elsewhere in physical memory, and must be retrieved from disk. This counter was designed as a primary indicator of the faults that cause system-wide delays. It is the sum of Memory: Pages Input/sec and Memory: Pages Output/sec. It is counted in numbers of pages, so it can be compared to other counts of pages, such as Memory: Page Faults/sec, without conversion. It includes pages retrieved to satisfy faults in the file system cache (usually requested by applications) and in non-cached mapped memory files. This counter displays the difference between the values observed in the last two samples, divided by the duration of the sample interval.
- **Pages Input/sec**—Number of pages read from disk to resolve hard page faults. Hard page faults occur when a process requires code or data that is not in its working set or elsewhere in physical memory, and must be retrieved from dis). This counter was designed as a primary indicator of the faults that cause system-wide delays. It includes pages retrieved to satisfy faults in the file system cache (usually requested by applications) and in non-cached mapped memory files. This counter counts numbers of pages, and can be compared to other counts of pages, such as Memory: Page Faults/sec, without conversion. This counter displays the difference between the values observed in the last two samples, divided by the duration of the sample interval.
- **Pages Output/sec**—Number of pages written to disk to free up space in physical memory. Pages are written back to disk only if they are changed in physical memory, so they are likely to hold data, not code. A high rate of pages output might indicate a memory shortage. Windows NT writes more pages back to disk to free up space when physical memory is in short supply. This counter counts numbers of pages, and can be compared to other counts of pages, without conversion. This counter displays the difference between the values observed in the last two samples, divided by the duration of the sample interval.
- **Page Reads/sec**—Number of times the disk was read to resolve hard page faults. Hard page faults occur when a process requires code or data that is not in its working set or elsewhere in physical memory, and must be retrieved from disk. This counter was designed as a primary indicator of the kinds of faults that cause system-wide delays. It includes reads to satisfy faults in the file system cache (usually requested by applications) and in non-cached mapped memory files.  This counter counts numbers of read operations, without regard to the numbers of pages retrieved by each operation.  This counter displays the difference between the values observed in the last two samples, divided by the duration of the sample interval.
- **Page Writes/sec**—Number of times pages were written to disk to free up space in physical memory.  Pages are written to disk only if they are changed while in physical memory, so they are likely to hold data, not code.  This counter counts write operations, without regard to the number of pages written in each operation.  This counter displays the difference between the values observed in the last two samples, divided by the duration of the sample interval.
- **Page Faults/sec**—Overall rate at which the faulted pages are handled by the processor. It is measured in numbers of pages faulted per second. A page fault occurs when a process requires code or data that is not in its working set (its space in physical memory). This counter includes both hard faults (those that require disk access) and soft faults (where the faulted page is found elsewhere in physical memory). Most processors can handle large numbers of soft faults without consequence. However, hard faults can cause significant delays. This counter displays the difference between the values observed in the last two samples, divided by the duration of the sample interval.
- **Cache Bytes**—Sum of the System Cache Resident Bytes, System Driver Resident Bytes, System Code Resident Bytes, and Pool Paged Resident Bytes counters.  This counter displays the last observed value only; it is not an average.
- **Cache Faults/sec**—Number of faults, that occur when a page sought in the file system cache is not found and must be retrieved from elsewhere in memory (a soft fault) or from disk (a hard fault). The file system cache is an area of physical memory that stores recently used pages of data for applications. Cache activity is a reliable indicator of most application I/O operations. This counter counts the number of faults, without regard for the number of pages faulted in each operation.
- **Pool Nonpaged Bytes**—Number of bytes in the nonpaged pool, an area of system memory (physical memory used by the operating system) for objects that cannot be written to disk, but must remain in physical memory as long as they are allocated.  Memory: Pool Nonpaged Bytes is calculated differently than Process: Pool

Nonpaged Bytes, so it might not equal Process: Pool Nonpaged Bytes: _Total.  This counter displays the last observed value only; it is not an average.

- **Cache Copy Reads/sec**—Frequency of reads from pages of the file system cache that involve a memory copy of the data from the cache to the application's buffer.
- **Cache Copy Read Hits %**—Percentage of cache copy read requests that hit the cache, that is, they did not require a disk read to provide access to the page in the cache. A copy read is a file read operation that is satisfied by a memory copy from a page in the cache to the buffer of the application.

## Network

### TCP

- **Active Connections**—Number of times TCP connections have made a direct transition to the SYN-SENT state from the CLOSED state.
- **Established Connections**—Number of TCP connections for which the current state is either ESTABLISHED or CLOSE-WAIT.
- **Segments/sec**—Rate at which TCP segments are sent or received using the TCP protocol.
- **Segments Retransmitted/sec**—Rate at which segments are retransmitted, that is, segments transmitted containing one or more previously transmitted bytes.
- **Connection Failures**—Number of times TCP connections have made a direct transition to the CLOSED state from the SYN-SENT state or the SYN-RCVD state, and the number of times TCP connections have made a direct transition to the LISTEN state from the SYN-RCVD state.

### Controller

- **Total Bytes/sec**—Rate at which bytes are sent and received on the interface, including framing characters.
- **Packets/sec**—Rate at which packets are sent and received on the network interface.
- **Output Queue Length**—Length of the output packet queue (in packets). If this length is longer than 2, delays are being experienced and the bottleneck should be found and eliminated if possible. Since the requests are queued by the Network Driver Interface Specification or NDIS in this implementation, this length is always set to zero.
- **Packet Outbound Errors**—Number of outbound packets that could not be transmitted because of errors.
- **Packet Receive Errors**—Number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.
- **Current Bandwidth (Mbits/sec)**—Estimate of the current bandwidth of the interface in megabits per second. For interfaces that do not vary in bandwidth or for those where no accurate estimation can be made, this value is the nominal bandwidth.
- **Bytes Sent/sec**—Rate at which bytes are sent on the interface, including framing characters.
- **Bytes Received/sec**—Rate at which bytes are received on the interface, including framing characters.
- **Packets Sent/sec**—Rate at which packets are sent on the network interface.
- **Packets Received/sec**—Rate at which packets are received on the network interface.

### Physical Disks

- **Volume**—Name of the physical drive for which statistical information is gathered.
- **Queue Length**—Average number of both read and write requests that were queued for the selected disk during the sample interval.
- **Disk Busy Time %**—Percentage of elapsed time that the selected disk-drive is servicing read or writes requests.

## Processes

- **Process**—Name of the task for which statistical information is gathered.
- **Threads**—Number of threads currently active in this process. An instruction is the basic unit of execution in a processor, and a thread is the object that executes instructions. Every running process has at least one thread.
- **Private Bytes**—Current number of bytes this process has allocated that cannot be shared with other processes.
- **PageFile Bytes**—Current number of bytes this process has used in the paging files. Paging files are used to store pages of memory used by the process that are not contained in other files. All processes share paging files and a lack of space in paging files can prevent other processes from allocating memory.
- **Working Set**—Current number of bytes in the working set of this process. The working set is the set of memory pages touched recently by the threads in the process. If free memory in the computer is above a threshold, pages are left in the working set of a process even if they are not in use. When free memory falls below the threshold, pages are trimmed from working sets. If they are needed, they are soft-faulted back into the working set before they leave main memory.

- **Page Faults/sec**—Rate at which the page faults occur in the executing threads within this process. A page fault occurs when a thread refers to a virtual memory page that is not in its working set in main memory. This does not cause the page to be fetched from disk if it is on the standby list and already in main memory, or if it is in use by another process with whom the page is shared.
- **% CPU Time**—Percentage of elapsed time that all the threads of this process used the processor to execute instructions. An instruction is the basic unit of execution in a computer, a thread is the object that executes instructions, and a process is the object created when a program is run. Code executed to handle some hardware interrupts and trap conditions are included in this count. On multi-processor machines, the maximum value of the counter is 100 % times the number of processors.
- **% Privileged CPU Time**—Percentage of elapsed time that the threads of the process have spent executing code in privileged mode. When a Windows NT system service is called, the service often runs in privileged mode to gain access to system-private data. Such data is protected from access by threads executing in user mode. Calls to the system can be explicit or implicit, such as page faults or interrupts. Unlike some early operating systems, Windows NT uses process boundaries for subsystem protection in addition to the traditional protection of user and privileged modes. These subsystem processes provide additional protection. Therefore, some work done by Windows NT on behalf of your application might be displayed in other subsystem processes in addition to the privileged time in your process.

# Processor Utilization

This window displays information about the system's processor utilization for different time intervals.

The system processor bar graphs display the percentage of total possible system processor utilization over the specified period of time. A bar graph is displayed for every processor installed in the device. Use this graph to determine if the system processor is a performance bottleneck.

# Storage

## Drive Array Controllers

This section displays general and status information about drive arrays. Select a drive array controller entry from the Mass Storage list to display a submenu containing separate entries for Array Controller Information, Physical Drives, Logical Drives, and storage system information. The following items display:

## Array Controller Information

Select an array controller from the Mass Storage list to display information for the controller.

The following information displays for each controller:

- **Model**—Displays the type of controller card.
- **Controller Status**—Displays the array controller board status. The following values are valid:
  - **OK**—The array controller is operating properly.
  - **General Failure**—The array controller has failed.
  - **Cable Problem**—The array controller has a cable problem. Check all cables to the controller.
  - **Powered Off**—The array controller does not have power. Replace the controller and restore power to the controller's slot.
  - **Unknown**—Indicates that the Storage Agents are unable to determine the status of the controller. You may need to upgrade the Storage Agents.
- **Current Role**—Displays the array controller's current role for duplexed array controllers. The following values are valid:
  - **Not Duplexed**—This array controller is not duplexed.
  - **Active**—This duplexed array controller is the active controller.
  - **Backup**—This duplexed array controller is the backup controller.
  - **Unknown**—Indicates that the Storage Agents are unable to determine the role of the controller. You may need to upgrade the Storage Agents.
- **Redundancy Model**—Displays the redundancy type for the controller. The following values are valid:
  - **Not Redundant**—This array controller is not in a redundant configuration.
  - **Driver Duplexing**—The array controller is using a controller duplexing algorithm implemented exclusively in the operating system driver.
  - **Firmware Active/Standby**—The array controller is using an active/standby algorithm implemented in the controller firmware and the operating system driver.

- **Firmware Primary/Secondary**—The array controller is using a primary/secondary algorithm implemented in the controller firmware and the operating system driver.
- **Unknown**—Indicates that the Storage Agents cannot determine the redundancy type for the controller. You may need to upgrade the Storage Agents.
- **Redundancy Error**—Displays the redundancy error for the controller. The following values are valid:
  - **No Failure**—No failures have been detected.
  - **No Redundant Controller**—No redundant controller is installed.
  - **Different Hardware**—The other controller indicates a different hardware model.
  - **No Link**—A link to the other controller could not be established.
  - **Different Firmware**—The other controller indicates a different firmware version.
  - **Different Cache**—The other controller indicates a different cache size.
  - **Other Cache Failure**—The other controller indicates a cache failure.
  - **No Drives**—This controller cannot see any attached drives, but the other controller can.
  - **Other No Drives**—This controller can see the attached drives, but the other controller cannot.
  - **Unsupported Drives**—One or more attached drives has been determined to be incapable of properly supporting redundant controller operation.
  - **Expand in Progress**—An expand operation is in progress. Redundant operation not supported until the expand operation is complete.
  - **Unknown**—Indicates that the Storage Agents are unable to determine the redundancy error for the controller. You may need to upgrade the Storage Agents.
- **Firmware Version**—Lists the firmware version of the array controller. This value can be used to help identify a particular revision of the controller.
- **Product Revision**—Displays the revision of the array controller board. This value can be used to help identify a particular revision of the controller.
- **Serial Number**—Displays the serial number for the array controller. Use this number for identification purposes.
- **Processor Usage**—Displays the total percentage of the processor usage, expressed as a number from 0 to 100 inclusive.
- **Command Count**—Displays the total number of read and write commands processed in this sample. This value is expressed as read and write commands per second.
- **Command Latency**—Displays the average command latency for this sample in 1/100,000 of a second units.
- **ADG Enabler Status**—Displays the array controller RAID ADG Enabler Module status. The module enables advanced controller features such as Advanced Data Guarding. The following values are valid:
  - **Not Supported**—Indicates that the RAID ADG Enabler Module is not supported by this type of controller.
  - **Not Present**—Indicates that the RAID ADG Enabler Module is not present or is not accessible.
  - **Fully Functional**—Indicates that the RAID ADG Enabler Module is functional and accessible.
  - **Bad Signature**—Indicates that the RAID ADG Enabler Module has an incorrect signature.
  - **Bad Checksum**—Indicates that the RAID ADG Enabler Module checksum failed.
  - **Present - Upgrade Firmware**—Indicates that the RAID ADG Enabler Module is installed, but a firmware upgrade is required to make it fully functional.
  - **Unknown**—Indicates that the Storage Agents do not recognize the RAID ADG Enabler Module. You may need to upgrade the Storage Agents.
- **Daughter Board Type**—Displays the type of daughter board installed on the array controller. The following values are valid:
  - **Not Supported**—Indicates that the array controller does not support daughter boards or it does not support daughter board identification.
  - **Not Present**—Indicates that a daughter board is not installed on the array controller.
  - **SCSI**—Indicates that a SCSI daughter board is installed on the array controller.
  - **Fibre**—Indicates that a Fibre daughter board is installed on the array controller.
  - **Array**—Indicates that an Array Expansion Module is installed on the array controller.
  - **Unknown**—Indicates that the daughter board type is not recognized. You may need to upgrade the Storage Agents.
- **Rebuild Priority**—Displays the logical drive rebuild priority of the controller. The following values are valid:
  - **Low**—Indicates the rebuild priority is low.
  - **Medium**—Indicates the rebuild priority is medium.

- **High**—Indicates the rebuild priority is high.
- **Unknown**—Indicates that the rebuild priority is not recognized. You may need to upgrade the Storage Agents.

- **Expand Priority**—Displays the logical drive expand priority of the controller. The following values are valid:
  - **Low**—Indicates the expand priority is low.
  - **Medium**—Indicates the expand priority is medium.
  - **High**—Indicates the expand priority is high.
  - **Unknown**—Indicates that the expand priority is not recognized. You may need to upgrade the Storage Agents.
- **Number of Ports**—Displays the number of usable SCSI ports on the controller. Sometimes *port* is also referred to as *bus* or *channel*. The number of ports does not indicate the number of connectors.
- **Internal SAS Ports**—Displays the number of internal SAS connectors on the controller.
- **External SAS Ports**—Displays the number of external SAS connectors on the controller.
- **Physical Drive Write Cache State**—Displays the controller setting for physical drive write cache. The following values are valid:
  - **Disabled**—Indicates the controller will disable write cache on all physical drives.
  - **Enabled**—Indicates the controller will enable write cache on all physical drives.
  - **Unknown**—Indicates the drive write cache state is not recognized. You may need to upgrade the Storage Agents.

## Array Accelerator Information

Select the accelerator item from the Mass Storage submenu to display the following information:

- **Status**—Displays the status of the array accelerator. The following values are valid:
  - **Enabled**—Cache operations are currently configured and enabled for at least one logical drive.
  - **Temporarily Disabled**—Cache operations have been temporarily disabled. Check the Array Accelerator Error Code for the monitored item to determine why the cache operations have been temporarily disabled.
  - **Permanently Disabled**—Cache operations have been permanently disabled. Check the Array Accelerator Error Code for the monitored item to determine why the cache operations have been disabled.
  - **Unavailable**—An Array Accelerator has not been configured.
  - **Unknown**—The Storage Agents cannot determine the status of the Array Accelerator. You may need to upgrade the Storage Agents.
- **Bad Data**—Indicates the possibility of data loss due to a battery problem when the system was powered on. The following values are valid:
  - **Possible**—At power-on, the battery pack was not sufficiently charged. Because the battery pack did not retain sufficient charge when the system resumed power, the Array Accelerator has not retained any data that may have been stored in the cache. If no data was in the cache, no data was lost. Several situations may have caused this condition:
    - If the system was without power for eight days, and the battery pack was on (the battery pack activates only if the system loses power unexpectedly), any data that may have been stored was lost.
    - There may be a problem with the battery pack. See the Battery Status monitored item for more information.
    - The Array Accelerator board has been replaced with a new board that has a discharged battery pack. In this case, no data is lost. Posted reads and writes are automatically enabled when the battery pack reaches full charge.
  - **None**—No data loss occurred. At power up, the battery pack was properly charged.
  - **Unknown**—The Storage Agents do not recognize the status. You may need to update your software.
- **Battery Status**—Displays the status of the battery pack on the Array Accelerator. The battery pack can recharge only when the system is powered on.
- **OK**—The battery pack is fully charged.
- **Failed**—The array controller has one or more array accelerator batteries that are failed. Array accelerator operations such as Battery Backed Write Cache, Expansion, Extension, and Migration are temporarily suspended until the batteries are replaced. Consult the user guide to learn how to identify and replace failed batteries.
- **Recharging**—The array controller has one or more array accelerator batteries that are recharging. Array accelerator operations such as Battery Backed Write Cache, Expansion, Extension, and Migration are

temporarily suspended until the batteries are fully charged. Array accelerator operations automatically resume when charging is complete.

- **Degraded**—The battery pack is still operating, but one of the batteries in the pack has failed to recharge properly. Your board should be serviced as soon as possible.
- **Not Present**—The battery pack is not present. Some controllers do not have a battery-backed cache.
- **Unknown**—The Storage Agents do not recognize the battery status. You may need to update your software.
- **Error Code**—Displays the status of the cache operations. The following values are valid:
- **None**—Cache operations are currently configured and enabled for at least one logical drive. No cache errors have occurred.
- **Bad Configuration**—Cache operations are temporarily disabled. This error could be caused if the Array Accelerator was switched from one controller to another. Schedule maintenance time to ensure that the board has been properly configured for this system.

**NOTE:** If data from another system was stored on the board, you must reconfigure it. Reconfiguring the board destroys any stored data.

- **Replace Battery**—The array controller has one or more array accelerator batteries that are failed. Array accelerator operations such as Battery Backed Write Cache, Expansion, Extension and Migration are temporarily suspended until the batteries are replaced. Consult the user guide to learn how to identify and replace failed batteries.
- **Low Battery**—The array controller has one or more array accelerator batteries that are recharging. Array accelerator operations such as Battery Backed Write Cache, Expansion, Extension and Migration are temporarily suspended until the batteries are fully charged. Array accelerator operations automatically resume when charging is complete.
- **Disable Command Issued**—Cache operations are temporarily disabled. This condition should not exist when the system regains power.
- **No Resources**—Cache operations are temporarily disabled. The controller does not have sufficient resources to perform cache operations. For example, when a replaced drive is being rebuilt, there are not sufficient resources. Once the operation that requires the resources has completed, this condition clears and cache operations resume.
- **Not Connected**—Cache operations are temporarily disabled. The Array Accelerator has been configured but is not currently attached to the controller. Check the alignment of the board and connections.
- **Bad Mirror Data**—Cache operations have been permanently disabled. The Array Accelerator stores mirrored copies of all data. If data exists in the cache when the system is first powered up, the Array Accelerator performs a data compare test between the mirrored copies. If the data does not match, an error has occurred. Data may have been lost and the board may need servicing.
- **Read Failure**—Cache operations have been permanently disabled. The Array Accelerator stores mirrored copies of all data. While reading the data, memory parity errors occurred so both copies were corrupted and cannot be retrieved. Data has been lost. Have the board serviced.
- **Write Failure**—Cache operations have been permanently disabled. This error occurs when an unsuccessful attempt was made to write data to the Array Accelerator. Data could not be written to write cache memory in duplicate due to the detection of parity errors. This error does not indicate data loss. Have the board serviced.
- **Configuration Changed**—Cache operations have been permanently disabled. The configuration of the logical drives has changed. Reconfigure the Array Accelerator.
- **Expand in Progress**—Cache operations are temporarily disabled due to an expand of a logical drive. When the expand operation completes, the accelerator is enabled.
- **Snapshot in Progress**—Cache operations are temporarily disabled due to a snapshot operation that is queued up or in progress. When the snapshot operation completes, the accelerator is enabled.
- **Redundant Low Battery**—Cache operations are temporarily disabled. The redundant controller has insufficient cache battery power.
- **Redundant Size Mismatch**—Cache operations are temporarily disabled. The cache sizes on the redundant controllers do not match.
- **Redundant Cache Failure**—Cache operations are temporarily disabled. The cache on the redundant controller has failed.
- **Excessive ECC Errors**—Cache operations have been permanently disabled. The number of cache lines experiencing excessive ECC errors has reached a preset limit.
- **ADG Enabler Missing**—Indicates that write cache operations have been temporarily disabled. An advanced data guarding logical drive is configured but the RAID ADG Enabler Module is broken or missing.

- **POST ECC Errors**—Indicates that write cache operations have been permanently disabled. The cache has been disabled due to a large number of ECC errors detected while testing the cache during the Power On Self Test (POST).
- **Battery Hot Removed**—Indicates that write cache operations have been permanently disabled. The cache has been disabled because a battery has been hot removed.
- **Unknown**—The Storage Agents do not recognize the error code. You may need to update your software.
- **Serial Number**—Displays the serial number for the Array Accelerator. Use this number for identification purposes.
- **Total Memory**—Displays the total amount of accelerator memory, including both battery-backed and non-battery-backed memory.
- **Write Cache**—Displays the percentage of cache memory allocated for posted write caching or the amount of memory allocated for the write cache. If the amount of memory is displayed then the actual usable memory is half the amount shown because the data is kept in duplicate (mirrored).
- **Read Cache**—Displays the percentage of cache memory allocated for read ahead caching or the amount of memory allocated for the read cache. If the amount of memory is displayed then the actual usable memory is half the amount shown because the data is kept in duplicate (mirrored).

**NOTE:** Read cache is not available on IDA-2 or SCSI Managed Array Technology (SMART) controllers. Values for these controllers will be zero.

- **Write Errors**—Displays the total number of write memory parity errors that were detected while writing to the Array Accelerator.

  Write parity errors occur when the system detects that information has not been transferred to the Array Accelerator correctly. A parity bit is included for each byte of information stored in memory. When the microprocessor reads or writes data, the system counts the value of the bits in each byte. If the total does not match the system's expectations, a parity error has occurred.

- **Read Errors**—Displays the total number of read memory parity errors that were detected while reading from the Array Accelerator. The mirrored copy of data in the write cache can be accessed to obtain correct data if a memory parity error occurs.

  Memory parity errors occur when the system detects that information has not been transferred correctly. A parity bit is included for each byte of information stored in memory. When the microprocessor reads or writes data, the system counts the value of the bits in each byte. If the total does not match the system's expectations, a parity error has occurred. A bad memory chip, memory corruption, or lack of memory refresh may cause memory parity errors.

## Identify Drives

Select the length of time to identify the physical drives that are connected to this controller from the drop-down list box and then click the **Start** button. The page automatically refreshes and displays an image of an identified drive and a Stop button. Click the **Stop** button to end identification before the time expires.

After the drive identification completes, the page must be refreshed manually to display the Start button. There may be a delay, depending on the length of the HP Insight Management Agents data collection interval, after the drive identification completes and before the Start button appears.

Only drives in hot plug trays are supported since the LEDs are part of the tray. If an individual logical drive or physical drive on this controller is selected while the drives connected to this controller are currently identified, the other drives stop identification and only the selected drive are identified.

When there are redundant controllers only the active controller can be used to identify the drives connected to the controller.

**IMPORTANT:** The Start or Stop button only displays if you are logged on as an administrator or an operator, SNMP Sets are enabled, and a SNMP Community string has been defined with 'write' access. Go back to the Summary page and select login to login as an administrator or operator. SNMP Sets can be enabled in the HP Insight Management Agents control panel applet on the SNMP Settings page. A SNMP Community string with 'write' access can be defined in the SNMP Service Properties Security page located in Computer Management under Services. The drive icon does not blink in Microsoft Internet Explorer unless Play animations in web pages is enabled in the Tools menu Internet Options under the Advanced tab in the Multimedia section.

## Physical Drive Information

This section provides an overview of all disk drives attached to the controller. Each physical drive is listed as a separate entry in the Mass Storage submenu. The information displayed next to the physical drive includes the condition of the drive, the location of the drive and drive size. Select any of the physical drives from the Mass Storage submenu to display more information about the drive.

The following information displays:

- **Status**—Indicates the status of the physical drive. The possible values are:
    - **OK**—The drive is functioning properly.
    - **Failed**—The drive is no longer operating and should be replaced.
    - **Predictive Failure**—The physical drive has a predictive failure error and should be replaced.
    - **Erasing**—The physical drive is currently being erased and in an offline state.
    - **Erase Done**—The erase operation has completed and the physical drive is in an offline state.
    - **Erase Queued**—An erase operation is currently queued for this physical drive.
    - **Unknown**—The physical drive cannot be monitored at this time. This may be due to:
    - The device driver for this drive may have been unloaded.

        The logical drive may have failed and been deactivated by the operating system. In this case, the last known status was OK.

        The Storage Agents do not recognize the drive. You may need to upgrade your software.

- **Action**—Displays the action that is required for this device. The following values are valid:
    - **Replace Drive**—Replace this drive. If the drive condition is Failed, check the Predictive Indicators, Problem Indicators, and Failure Indicators for a possible cause of the failure.
    - **Replace S.M.A.R.T. Drive**—The S.M.A.R.T. hard drive predicts imminent failure. Schedule replacement of the drive before an actual failure occurs.
    - **No Action Required**—The drive is operating normally and no action is required.
- **Capacity**—Displays the size of the physical drive.
- **Model**—Displays a description of the physical drive. The text depends on the manufacturer of the drive and the drive type.

    If a drive fails, note the model to identify the type of drive necessary for replacement.

- **Firmware Version**—Displays the physical drive firmware version number. Make sure you have the most recent version of the firmware because older versions may not support all of the newest features.
- **Serial Number**—Displays the serial number assigned to the physical drive. This value is based on the serial number as returned by the SCSI inquiry command but may be modified due to space limitations. This item can be used for identification purposes.
- **Service Hours**—Displays the current number of hours of service (the number of hours that a physical drive has been spinning) since the drive was stamped. The drive was stamped when it left the factory.

    For example, if the Current Service Hours value is 604, the drive has been operating for 604 hours. If an error occurred at 499 Service Hours, it occurred after 499 hours of service.

- **S.M.A.R.T. Support**—Indicates whether or not the SCSI physical drive supports S.M.A.R.T. The possible values are:
    - **Available**—This drive supports predictive failure monitoring.
    - **Not available**—Predictive failure monitoring is not available for this drive.
    - **Unknown**—The Storage Agents cannot determine if the drive supports predictive failure monitoring. You may need to upgrade your driver or Storage Agents.

    **NOTE:** A value of Unknown indicates that the agents cannot determine this information from the physical drive.

- **Current Width**—Displays the current negotiated data transfer width for a SCSI physical drive. The possible values are:
    - **Narrow (8 bits)**—The negotiated data transfer width for this drive is narrow (8 data bits).
    - **Wide (16 bits)**—The negotiated data transfer width for this drive is wide (16 data bits).
    - **Unknown**—The Storage Agents are unable to determine the current negotiated data transfer width for this drive.

- **Current Speed**—Displays the current negotiated data transfer rate for a SCSI physical drive. The possible values are:
  - **Asynchronous**—The negotiated data transfer rate for this drive is asynchronous.
  - **Fast**—The negotiated data transfer rate for this drive is 20 megabytes per second.
  - **Ultra**—The negotiated data transfer rate for this drive is 40 megabytes per second.
  - **Ultra2**—The negotiated data transfer rate for this drive is 80 megabytes per second.
  - **Ultra3**—The negotiated data transfer rate for this drive is 160 megabytes per second.
  - **Ultra320**—The negotiated data transfer rate for this device is 320 megabytes per second.
  - **Unknown**—The agent is unable to determine the negotiated data transfer rate for this drive.

  📝 **NOTE:** If the negotiated data transfer width is Narrow (8 bits), the actual data transfer rate is equal to half the negotiated data transfer rate. For example, if the current negotiated data transfer rate is Ultra (40 megabytes per second) and the width is Narrow, then the actual data transfer rate is 20 megabytes per second.

- **Placement**—Indicates whether the physical drive is in an internal or external storage system. The following values are valid:
  - **Internal**—The physical drive is in an internal storage system.
  - **External**—The physical drive is in an external storage system.
  - **Unknown**—The physical drive is not in a storage system or the Storage Agents cannot determine the drive placement.

  ⬍This symbol indicates that the drive is a hot plug drive.

- **Rotational Speed**—Indicates the rotational speed of the drive in revolutions per minute.
- **Drive Type**—Indicates the type of physical drive. The following values are valid:
  - **SCSI**—The physical drive is a parallel SCSI drive.
  - **SATA**—The physical drive is a Serial ATA drive.
  - **SAS**—The physical drive is a Serial attached SCSI drive.
  - **Unknown**—The Storage Agents cannot determine the drive type.
- **Negotiated Link Rate**—Displays the negotiated link rate for SAS and SATA physical drives. The possible values are:
  - **1.5 Gbps**—The negotiated link rate for this drive is 1.5 gigabits per second.
  - **3.0 Gbps**—The negotiated link rate for this drive is 3.0 gigabits per second.
  - **6.0 Gbps**—The negotiated link rate for this drive is 6.0 gigabits per second.
  - **Unknown**—The agent is unable to determine the negotiated link rate for this drive.
- **NCQ Support**—Displays the status of Native Command Queuing support for this drive. The possible values are:
  - **No Controller Support**—The array controller does not support NCQ.
  - **No Drive Support**—The array controller does support NCQ, but the drive does not.
  - **Disabled**—The array controller and drive support NCQ, but it is disabled.
  - **Enabled**—The array controller and drive support NCQ and it is enabled.
  - **Unknown**—The agent is unable to determine the NCQ configuration for this drive or it is not a SATA drive.
- **Phy Count**—Displays the number of phys for each physical drive. Single-ported drives have one phy. Dual-ported drives have two phys.
- **Multipath Status**—Displays the overall multipath status of this physical drive. The following values are valid:
- **Not Configured**—Indicates that the physical drive is not configured to have multipath access.
- **Redundant**—Indicates that the physical drive currently has more than one I/O path to the controller.
- **Not Redundant**—Indicates that the physical drive previously had more than one I/O path to the controller but now has no redundant I/O path.
- **Disk Failed**—Indicates that the physical drive has failed.

## Paths

For multipath-capable hardware, the status and role of each data path to the physical drive is reported.

- **Path**—Indicates the path to the physical drive. Each path is identified by a descriptor, for example "Port 2E Box 1 Bay 12" indicates a path from the host adapter external port number 2 ("Port 2E") to the 12th bay in the first box.

- **Status**—Indicates the status of the data path. Possible values are:
    - **OK**—The path is operational.
    - **Link down**—The path is not operational.
    - **Unknown**—The path status cannot be determined.
- **Role**—Indicates the role of this path in the configuration. Possible values are:
    - **Active**—This path is the preferred data path to the physical drive.
    - **Alternate**—This path is the alternate data path to the physical drive.
    - **Unknown**—The role of this path cannot be determined.

### Identify Drive

Select the length of time to identify the physical drive from the drop-down list box and then click the **Start** button. The page automatically refreshes, and then an image of an identified drive and a **Stop** button appears. Click the **Stop** button to end identification before the time expires.

After the drive identification completes, the page must be manually refreshed to display the **Start** button. There may be a delay, depending on the length of the HP Insight Management Agents data collection interval, after the drive identification completes and before the **Start** button appears.

Only drives in hot plug trays are supported since the LEDs are part of the tray. Only one drive on a selected controller may be identified at a time. If a different drive is selected while another drive is currently identified then the other drive stops identification and the selected drive is identified.

**IMPORTANT:** The **Start** or **Stop** button only be appears if you are logged on as an administrator or an operator, SNMP Sets are enabled, and a SNMP Community string has been defined with 'write' access. Go back to the **Summary** page and select **login** to login as an administrator or operator. SNMP Sets can be enabled in the HP Insight Management Agents control panel applet on the SNMP Settings page. A SNMP Community string with 'write' access can be defined in the SNMP Service Properties Security page located in Computer Management under Services. The drive icon does not blink in Microsoft® Internet Explorer unless "Play animations in web pages" is enabled in the Internet Options Tools menu under the **Advanced** tab in the **Multimedia** section.

## Logical Drive Information

### Spare Information

This section provides additional information about the spare drive, including status and the number of physical drives it replaces, if any. This section is available only if this physical drive is configured as a spare drive. The following information is available:

- **Status**—Displays the status of the on-line spare drive. The following values are possible:
    - **Building**—A physical drive has failed. Automatic Data Recovery is in progress to recover data to the on-line spare.
    - **Active**—A physical drive has failed. Automatic Data Recovery is complete. The system is using the on-line spare as a replacement for the failed drive.
    - **Failed**—The on-line spare has failed and is no longer available for use.
    - **Inactive**—The monitored system has an on-line spare configured, but is not currently in use.
    - **Unknown**—You may need to upgrade your software.

When the status is Building, one of the following displays, which indicates the progress of the Automatic Data Recovery:

- **Percent Rebuild Complete**—Displays the percent complete of the rebuild. When the value reaches 100, the rebuilding process is complete. The drive array continues to operate in interim recovery mode during the rebuild.
- **Rebuild Blocks Left**—Displays the number of blocks of data that still need to be redistributed. When the value reaches 0, the rebuilding process is complete. The array continues to operate interim recovery mode during the rebuild.
- **Replaced Drives**—Identifies the failed physical drives in the logical drive that the spare drive has replaced. Use this monitored item to identify the failed drives and replace those drives as soon as possible.

    If N/A displays, the spare has not begun operating in place of the failed drive.

## Predictive Indicators

Use the Predictive Indicators to predict when a drive, which is now operating normally, may need to be replaced.

- **S.M.A.R.T. Status**—Displays the S.M.A.R.T. status as reported by the physical drive. This is only displayed if the drive supports S.M.A.R.T. predictive failure. The possible values are:
  - **Other**—The Storage Agent is unable to determine the status of S.M.A.R.T. predictive failure monitoring for this drive.
  - **OK**—Indicates the drive is functioning properly.
  - **Replace Drive**—Indicates that the drive has a S.M.A.R.T. predictive failure error and should be replaced.

The predictive indicators listed below are not displayed if the physical drive does not support any of the indicators and S.M.A.R.T. status is available.

The numerical data associated with these items displays after the item name. For example, Used Realloc: 122 means that there are 122 used reallocation sectors for this drive. The status of these items can be OK or Replace Drive. If the status is Replace Drive, replace the drive, or an actual drive failure may occur in the future. The Predictive Indicators are:

Functional Test 1, 2, and 3 provides information about a series of tests that indicates how well a physical drive works. The status of these items can be OK or Replace Drive. If the status is Replace Drive, replace the drive, or an actual drive failure may occur in the future.

These tests compare the way the physical drive currently operates when performing various tasks with the way it worked when it was new.

- **Used Realloc**—Displays the number of sectors of the reallocation area that have been used by the physical drive. The status of this item can be OK or Replace Drive. If the status is Replace Drive, replace the drive, or an actual drive failure may occur in the future.

  Because of the nature of magnetic disks, certain sectors on a drive may have media defects. The reallocation area is part of the drive that the drive manufacturer sets aside to compensate for these defects. The array controller writes information addressed from the unusable sectors to available sectors in the reallocation area. If too many sectors have been reallocated, there may be a problem with the drive.

- **Spinup Time**—Displays the time it takes for a physical drive to spin up to full speed. The Status of this item can be OK or Replace Drive. If the status is Replace Drive, replace the drive, or an actual drive failure may occur in the future.

  Drives require time to gain momentum and reach operating speed. As cars are tested to go from 0 mph to 60 mph in X number of seconds, drive manufacturers have preset expectations for the time it takes the drive to spin to full speed. Drives that do not meet these expectations may have problems.

  The spinup time value is shown in tenths of a second. Thus, if the drive takes 12 seconds to spin up, the value would be 120. The value may be 0 for this monitored item under one of the following conditions:

  - You are monitoring a physical drive that is part of the managed system's internal drive array storage, and you use a warm boot to reset the monitored system. During a warm boot, the drives continue to spin.
  - You are monitoring a physical drive in an external storage system and you reset the managed server but not the storage system.
  - The physical drive may be configured to start up immediately when the system is powered on, instead of waiting for the controller to start it.

## Problem Indicators

Use the Problem Indicators to determine when a drive failure has occurred that may be correctable without replacing the drive. The Problem Indicators are:

- **Failed Recovery Reads**—Shows the number of read errors that occurred while Automatic Data Recovery was being performed from this physical drive to another drive. If a read error occurs, Automatic Data Recovery stops.

- **Other Timeouts**—Shows the number of times the drive did not respond with an interrupt within a controller-defined period of time after a command had been issued. This monitored item does not include Data Request (DRQ) timeouts.

  If the other timeouts count is not zero and the drive has failed, the failure might be correctable without replacing the drive. Verify the status of the drive by checking the following:

  - Ensure that all system and storage system cables are intact and seated properly. You may need to replace the cables.
  - Ensure that a storage system is plugged in and powered on. Make sure the power supply is functioning.

**IMPORTANT:** Never turn off a storage system when the attached system is still turned on.

- Check the physical proximity of the system to other electrical devices. Since electrical noise may cause this error, check the AC circuit for other electrical devices.

  Timeouts can be caused when two or more drives are set to the same SCSI ID. Ensure that the storage system and system SCSI IDs do not conflict.

- On a storage system, check the SCSI ID cable on the drive tray. If the cable is damaged or incorrectly installed, SCSI Timeouts can occur. See the documentation accompanying the Hot Plug Drive Tray Service Spare Kit.

- Ensure that the system temperature is within specified limits. Ensure that the fans are operating and are not blocked.

  In some instances, drive failure can cause Timeouts. If you continue to receive many of these errors, replace the drive.

- **SCSI Bus Faults**—Displays the number of times that SCSI bus parity, overrun, or underrun errors have been detected on the SCSI bus. Since the controller retries the operation, SCSI bus faults can cause a drop in performance, or, in some cases, data corruption.

  If the count is not zero and the drive has failed, the failure might be correctable without replacing the drive. Verify the status of the drive by checking the following:

  - Ensure that all system and storage system cables are intact and seated properly. You may need to replace the cables.

  - Check the physical proximity of the system to other electrical devices. Since electrical noise may cause a Bus Fault error, check the AC circuit for other electrical devices.

  - Ensure that the system temperature is within specified limits. Ensure that fans are operating and are not blocked.

    SCSI Bus Faults can be caused when two or more drives are set to the same SCSI ID. Ensure that storage system and system SCSI IDs do not conflict.

    In some instances, drive failure can cause SCSI Bus Faults. If you continue to receive many of these errors, replace the drive.

- **IRQ Deglitch**—Displays the number of times that a glitch has been detected on the drive interface cable. Since the controller retries the operation, problems can cause a drop in performance or, in some cases, data corruption. Glitches indicate electrical noise on the drive cable or an intermittent failure of the drive electronics.

  This item is considered a Problem Indicator that may be correctable without replacing the drive. Verify the status of the drive by checking the following:

  - Ensure that all system and storage system cables are intact and seated properly. You may need to replace cables.

  - Check the physical proximity of the system to other electrical devices. Since electrical noise may cause a glitch error, check the AC circuit for other electrical devices.

  - If you continue to receive many of these errors, replace the drive.

## Failure Indicators

Use the Failure Indicators to determine the cause of a drive failure. Typically, the number of failures is zero when the drive is operating normally. If a counter is not zero and the drive has not failed, there could be an intermittent problem that may require the drive to be replaced.

The Failure Indicators are:

- **Spinup Errors**—When the physical drive fails due to the failure of a spin-up command, a Spinup Error occurs. If the failure count is not zero and the drive has failed, replace the drive.

  If the counter is not zero and the drive is OK (has not failed), there may be an intermittent problem that requires drive replacement. If you observe that the count is increasing over time, replace the drive.

- **Aborted Commands**—The Aborted Commands counter records the number of times that a physical SCSI drive returned an Aborted Command status when a SCSI command was attempted. This error count indicates unsuccessful termination of the SCSI command. When the physical drive is failed due to aborted commands that could not be retried successfully, Aborted Commands errors occur. If the number of errors is not zero and the drive has failed, replace the drive.

  If the counter is not zero and the drive is OK (has not failed), there may be an intermittent problem that requires drive replacement. If you observe that the count is increasing over time, replace the drive.

- **Reallocation Aborts**—When the physical drive is failed due to an error that occurred when the controller was trying to reallocate a bad sector, a Reallocation Abort error occurs.

  Because of the nature of magnetic disks, certain sectors on a drive may have media defects. The reallocation area part of the drive is set aside to compensate for these defects. The array controller writes information addressed from unusable sectors to available sectors in the reallocation area.

  If the number of reallocation abort errors is not zero and the drive has failed, replace the drive. If the counter is not zero and the drive is OK (has not failed), there may be an intermittent problem that requires drive replacement. If you observe that the count is increasing over time, replace the drive.

- **Media Failures**—When this physical drive fails due to unrecoverable media errors, a Media Failure occurs.

  If the number of media failure errors is not zero and the drive has failed, replace the drive. If the counter is not zero and the drive is OK (has not failed), there may be an intermittent problem that requires drive replacement. If you observe that the count is increasing over time, replace the drive.

- **Format Errors**—When a format operation fails because the controller was unable to remap a bad sector, a Format Error occurs.

  If the number of format errors is not zero and the drive has failed, replace the drive. If the counter is not zero and the drive is OK (has not failed), there may be an intermittent problem that requires drive replacement. If you observe that the count is increasing over time, replace the drive.

- **Hardware Errors**—The Hardware Errors counter records the number of times that a physical SCSI drive returned a Hardware Error status when a SCSI command was attempted. This error status indicates unsuccessful termination of the SCSI command. The controller typically retries this command several times before failing the drive.

  If the number of hardware errors is not zero and the drive has failed, replace the drive. If the counter is not zero and the drive is OK (has not failed), there may be an intermittent problem that requires drive replacement. If you observe that the count is increasing over time, replace the drive.

- **Not Ready Errors**—When a physical drive returns a not ready status when it should be ready, a Drive Not Ready Error occurs. This error could occur if a drive spins down unexpectedly or if the drive never becomes ready after the spin up command is issued.

  If the number of not ready errors is not zero and the drive has failed, replace the drive. If the counter is not zero and the drive is OK (has not failed), there may be an intermittent problem that requires drive replacement. If you observe that the count is increasing over time, replace the drive.

- **Bad Target Errors**—When a physical drive performs an action that does not conform to the SCSI-2 port protocol, the SCSI port is reset.

  If the number of bad target errors is not zero and the drive has failed, replace the drive. If the counter is not zero and the drive is OK (has not failed), there may be an intermittent problem that requires drive replacement. If you observe that the count is increasing over time, replace the drive.

- **Failed Recovery Writes**—indicates whether write errors occurred while Automatic Data Recovery was being performed to this physical drive. If a write error occurs, Automatic Data Recovery stops. These errors indicate that the physical drive has failed.

  If the number of fail recov writes is not zero and the drive has failed, replace the drive. If the counter is not zero and the drive is OK (has not failed), there may be an intermittent problem that requires drive replacement. If you observe that the count is increasing over time, replace the drive.

- **Self-Test Errors**—Indicates if a physical drive failed its self test. The physical drive does a self test each time the system is turned on.

  If the number of self-test errors is not zero and the drive has failed, replace the drive. If the counter is not zero and the drive is OK (has not failed), there may be an intermittent problem that requires drive replacement. If you observe that the count is increasing over time, replace the drive.

The above information is available for those drives that have been stamped with monitoring and performance data enabled. The drive was stamped when it left the factory.

## Statistics

This section displays statistics about a specific drive array controller physical drive. You can use the run-time statistics to monitor the health of a specific drive.

The following information displays:

- **Sectors Read**—Shows the total number of sectors read from the physical drive since the drive was stamped. The drive was stamped when it left the factory.

- **Hard Read Errors**—Displays the number of read errors that could not be recovered by a physical drive's Error Correction Code (ECC) algorithm or through retries. Over time, a drive may produce these errors. If you receive these errors, a problem may exist with your drive.

  The severity of these errors depends on whether the managed system is running in a fault tolerant mode. With fault tolerance, the controller can remap data to eliminate the problems caused by these errors.

- **Recovered Read Errors**—Displays the number of read errors corrected through physical drive retries. Over time, all drives produce these errors. If you notice a rapid increase in the value for Recovered Read Errors or Hard Read Errors, a problem may exist with the drive. Expect more errors for this monitored item than for Hard Read Errors.

- **Total Seeks**—Displays the total number of seek operations during seek tests performed by the physical drive since the drive was stamped. The drive was stamped when it left the factory.

  During normal reads and writes to the drive, the drive does implied seeks to the location where data resides. These are not included in this count.

- **Seek Errors**—Displays the number of seek errors that a physical drive detects. A seek error is a seek that failed. Over time, a drive usually produces these errors. If you notice a rapid increase in the value shown for Seek Errors, this physical drive may be failing. Only an unusually rapid increase in these errors indicates a problem.

- **Sectors Written**—Displays the total number of sectors written to the physical drive since the drive was stamped. The drive was stamped when it left the factory.

- **Hard Write Errors**—Displays the number of write errors that could not be recovered by a physical drive. Over time, a drive may produce these errors. If you notice an increase in the value shown for Hard Write Errors or Recovered Write Errors, a problem may exist with the drive. The counter value increases every time the physical drive detects another error. On average, these errors should occur less frequently than read errors.

- **Recovered Write Errors**—Displays the number of write errors corrected through physical drive retries or recovered by a physical drive on a monitored system. Over time, a drive may produce these errors. If you notice an increase in the value shown for Recovered Write Errors or Hard Write Errors, a problem may exist with the drive.

  The Recovered Write Errors value increases every time the physical drive detects and corrects an error. Only an unusually rapid increase in these errors indicates a problem. On average, these errors should occur less frequently than read errors.

- **Hot-Plug Count**—Indicates the number of times this physical drive was removed via a hot-plug event from a storage system since the drive was stamped. The drive was stamped when it left the factory.

- **DRQ Timeouts**—Displays the number of times that a physical drive continued to request data but did not get a command completion. This value increases every time a Data Request (DRQ) timeout occurs for the physical drive.

  A defective drive or cable may cause DRQ timeouts to occur. If you see an increase in these errors, ensure that the cables connecting the drive are intact.

## Logical Drive Information

A list of logical drives associated with the controller displays in the Mass Storage submenu. Each logical drive in the list displays the condition, logical drive number and the fault tolerance of that logical drive. Select one of the logical drive entries to display the following information.

- **Status**—Displays the status of the logical drive. The logical drive can be in one of the following states:
    - **OK**—Indicates that the logical drive is in normal operation mode.
    - **Failed**—Indicates that more physical drives have failed than the fault tolerance mode of the logical drive can handle without data loss.
    - **Unconfigured**—Indicates that the logical drive is not configured.
- **Interim recovery**—Indicates that the logical drive is using Interim Recovery Mode. In Interim Recovery Mode, at least one physical drive has failed, but the logical drive's fault tolerance mode lets the drive continue to operate with no data loss.
- **Ready rebuild**—Indicates that the logical drive is ready for Automatic Data Recovery. The physical drive that failed has been replaced, but the logical drive is still operating in Interim Recovery Mode.
- **Rebuilding**—Indicates that the logical drive is currently doing Automatic Data Recovery. During Automatic Data Recovery, fault tolerance algorithms restore data to the replacement drive.
- **Wrong drive**—Indicates that the wrong physical drive was replaced after a physical drive failure.
- **Bad connect**—Indicates that a physical drive is not responding.
- **Overheating**—Indicates that the drive array enclosure that contains the logical drive is overheating. The drive array is still functioning, but should be shutdown.

- **Shutdown**—Indicates that the drive array enclosure that contains the logical drive has overheated. The logical drive is no longer functioning.
- **Expanding**—Indicates that the logical drive is currently doing Automatic Data Expansion. During Automatic Data Expansion, fault tolerance algorithms redistribute logical drive data to the newly added physical drive.
- **Not available**—Indicates that the logical drive is currently unavailable. If a logical drive is expanding and the new configuration frees additional disk space, this free space can be configured into another logical volume. If this is done, the new volume is set to not available.
- **Queued for expansion**—Indicates that the logical drive is ready for Automatic Data Expansion. The logical drive is in the queue for expansion.
- **Multipath access degraded**—Indicates that all the physical drives in the logical drive were previously accessible by at least two paths, but now at least one physical drive within that logical drive is accessibly by only a single path due to a hardware fault or a hardware configuration change (e.g. mistakenly replacing a dual ported drive with a single ported drive.)
- **Erasing**—Indicates that the logical drive is currently being erased.
- **Unknown**—You may need to upgrade your software.

When the status is Rebuilding one of the following values displays to indicate the progress of the rebuild:

- **Percent Rebuild Complete**—Displays the percent complete of the rebuild. When the value reaches 100, the rebuilding process is complete. The drive array continues to operate in interim recovery mode while the drive is rebuilding.
- **Rebuild Blocks Left**—Displays the number of blocks of data that still need to be redistributed. When the value reaches 0, the rebuilding process is complete. The array continues to operate in interim recovery mode while the drive is rebuilding.
- **Rebuilding Drive**—Identifies the physical drive that failed. The logical drive is rebuilding using a spare drive in place of this failed drive.

When the status is Expanding one of the following values displays to indicate the progress of the expansion.

- **Percent Expand Complete**—Displays the percent complete of the expansion. When a logical volume is expanding, the drive must redistribute the logical volume data across the physical drives. When the value reaches 100, the expansion process is complete.
- **Expand Blocks Left**—Displays the number of blocks of data that still need to be redistributed. When the value reaches 0, the expansion process is complete. The array continues to operate normally while the drive is expanding.
- **Fault Tolerance**—Displays the fault tolerance mode of the logical drive. To change the fault tolerance mode, run the Array Configuration Utility.

The following values are valid for the Logical Drive Fault Tolerance:

- **None**—(RAID 0) fault tolerance is not enabled. If a physical drive reports an error, the data cannot be recovered by the Drive Array.
- **Mirroring**—(RAID 1/RAID 0+1) is the highest level of fault tolerance. It is the only method offering fault tolerance protection if no more than two physical drives are selected. Drive mirroring creates fault tolerance by storing duplicate data on two drives. There must be an even number of drives. This is the most costly fault tolerance method because it requires 50 percent of the drive capacity to store the redundant data.
- **Data Guarding**—(RAID 4) assures data reliability while using only a small percent of the logical drive storage capacity. A designated, single physical drive contains parity data. If a drive fails, the controller uses the data on the parity drive and the data on the remaining drives to reconstruct data from the failed drive. This allows the system to continue operating with slightly reduced performance until you replace the drive.
- **Distributed Data Guarding**—(RAID 5) stores parity data across all the physical drives in the array and allows more simultaneous read operations and higher performance than data guarding (RAID 4). If a drive fails, the controller uses the parity data and the data on the remaining drives to reconstruct data from the failed drive. The system then continues operating with a slightly reduced performance until you replace the failed drive.
- **Advanced Data Guarding**—(RAID 6) is the fault tolerance method that provides the highest level of data protection. It stripes data and parity across all the physical drives in the configuration to ensure the uninterrupted availability of uncorrupted data. This fault-tolerance method is similar to RAID 5 in that parity data is distributed across all drives in the array, except in RAID ADG the capacity of multiple drives is used to store parity data. Assuming the capacity of 2 drives is used for parity data, this allows continued operation despite simultaneous failure of any 2 drives in the array, whereas RAID 4 and RAID 5 can only sustain failure of a single drive.

- **RAID 50**—Distributed data guarding (RAID 5) with multiple parity groups.
- **RAID 60**—Advanced data guarding (RAID 6) with multiple parity groups.
- **Unknown**—You may need to upgrade your software.
- **Capacity**—Displays the size of the logical drive.
- **Accelerator**—Indicates whether the logical drive has an Array Accelerator board configured and enabled. The following values are valid:
  - **Enabled**—The Array Accelerator board is configured and enabled for this logical drive.
  - **Disabled**—The Array Accelerator board is configured but not enabled for this logical drive.
  - **Unavailable**—There is no Array Accelerator board configured for this logical drive.
  - **Unknown**—The Storage Agents do not recognize the Array Accelerator board. You may need to upgrade your software.
- **Stripe Size**—Displays the size of a logical drive stripe in kilobytes.
- **Total Read and Write Requests**—Displays the total number of read and write requests for the logical volume, expressed in reads and writes per second.
- **Reads**—Displays the number of read requests for the logical volume, expressed in reads per second.
- **Writes**—Displays the number of write requests for the logical volume, expressed in writes per second.
- **Sectors Read**—Displays the number of sectors read for the logical volume for this interval. This value is expressed in sectors per second.
- **Sectors Written**—Displays the number of sectors written for the logical volume for this interval. This value is expressed in sectors per second.
- **OS Assigned Name**—Displays the operating system name associated with this logical drive.
- **Multipath Status**—Displays the overall multipath status of this logical drive. The following values are valid:
  - **Not Configured**—Indicates that this logical drive is not configured to have multipath access.
  - **Redundant**—Indicates that all disks of this logical drive currently have more than one I/O path to the controller.
  - **Not Redundant**—Indicates that all disks of this logical drive previously had more than one I/O path to the controller but now one or few of them have no redundant I/O path.

## Identify Drive

1. Select the length of time to identify the physical drives that make up the logical drive from the drop-down list box, and then click the **Start** button. The page automatically refreshes and an image of an identified drive and a **Stop** button appears.
2. Click the **Stop** button to end identification before the time expires.

After the drive identification completes, the page must be manually refreshed to display the **Start** button. There may be a delay, depending on the length of the HP Insight Management Agents data collection interval, after the drive identification completes and before the **Start** button appears.

Only drives in hot plug trays are supported since the LEDs are part of the tray. Spare drives that are included in the logical drive are also identified. Only one logical drive on a selected controller may be identified at a time. If a different drive is selected while another drive is currently identified, the other drive stops identification and the selected drive is identified.

## Tape Storage System Information

Select the **Tape Storage System Information** entry from the Mass Storage submenu to display the following information.

- **Status**—Displays the status of the tape storage system. The following values are valid:
  - **OK**—Indicates that the library is operating normally.
  - **Degraded**—Indicates the library has degraded in some manner.
  - **Failed**—Indicates the library has failed and can no longer return data. The library may need to be replaced.
  - **Offline**—Indicates the Storage Agents can no longer communicate with the library. This could be caused by a cabling problem or the library may be powered off.
  - **Unknown**—The state of the tape library cannot be determined. You may need to upgrade the Storage Agents.
- **Model**—Displays the model name of the tape library. Use this value for identification purposes.
- **Firmware Revision**—Displays the firmware revision level of the tape library. The level can be used for identification purposes.

- **Serial Number**—Displays the unit serial number for the tape library. Use this value for identification purposes.
- **Protocol Type**—Displays the protocol used to communicate with the tape library. The following values are valid:
  - **Parallel SCSI**—The protocol is Parallel SCSI.
  - **Serial ATA**—The protocol is Serial ATA.
  - **SAS**—The protocol is Serial Attached SCSI.
  - **Unknown**—The Storage Agents are unable to determine the protocol.
- **Current Width**—Displays the current negotiated data transfer width for Parallel SCSI tape libraries. The possible values are:
  - **Narrow (8 bits)**—The negotiated data transfer width for this tape library is narrow (8 data bits).
  - **Wide (16 bits)**—The negotiated data transfer width for this tape library is wide (16 data bits).
  - **Unknown**—The Storage Agents are unable to determine the current negotiated data transfer width for this tape library.
- **Current Speed**—Displays the current negotiated data transfer speed for Parallel SCSI tape libraries. The possible values are:
  - **Asynchronous**—The current data transfer speed for this tape library is asynchronous.
  - **Fast**—The current data transfer speed for this tape library is 10 million transfers per second.
  - **Ultra**—The current data transfer speed for this tape library is 20 million transfers per second.
  - **Ultra2**—The current data transfer speed for this tape library is 40 million transfers per second.
  - **Ultra3**—The current data transfer speed for this tape library is 80 million transfers per second.
  - **Unknown**—The agent is unable to determine the current negotiated data transfer speed for this tape library.

  **NOTE:** If the current data transfer width is Narrow (8 bits) then the speed in megabytes per second is equal to the million transfers per second speed. If the current width is Wide (16 bits) then the speed in megabytes per second is twice the million transfers per second speed. For example, if the current speed is Ultra and the width is Wide then the speed would be 40 megabytes per second.

- **Negotiated Link Rate**—Displays the negotiated link rate for SAS and SATA tape libraries. The possible values are:
  - **1.5 Gbps**—The negotiated link rate for this tape library is 1.5 gigabits per second.
  - **3.0 Gbps**—The negotiated link rate for this tape library is 3.0 gigabits per second.
  - **Unknown**—The agent is unable to determine the negotiated link rate for this tape library.
  - **Door Status**—Displays the status of the door. The following values are valid:
  - **Not Supported**—The door status is not supported by the device.
  - **Closed**—The door is closed.
  - **Open**—The door is open.
  - **Unknown**—The state of the tape library door cannot be determined. You may need to upgrade the Storage Agents.
- **Total Moves**—Displays the number of tape moves for the library loader arm.
- **Service Hours**—Displays the number of hours of operation for the library.

## Associated Tape Drives

To see more information about the tape drive, see the product information on the HP website **http://www.hp.com/**.

## Tape Drive Information

Select one of the tape drive entries from the Mass Storage submenu to display the following information about that drive.

- **Status**—Displays the status of the tape drive. The following values are valid:
  - **OK**—Indicates the tape drive is operating normally.
  - **Degraded**—Indicates the tape drive has degraded in some manner.
  - **Failed**—Indicates the tape drive has failed and can no longer return data. The tape drive may need to be replaced.
  - **Offline**—Indicates the Storage Agents can no longer communicate with the tape drive. This could be caused by a cabling problem or the tape drive may be powered off.
  - **Missing - Was OK**—Indicates that a tape drive that was located in a system and had a status of OK has been removed.

- **Missing - Was Offline** —Indicates that a tape drive that was located in a system and had a status of offline has been removed.
- **Unknown**—Indicates that the state of the tape drive cannot be determined. You may need to upgrade the Storage Agents.
- **Model**—Displays the model name of the tape drive. Use this value for identification purposes.
- **Firmware Revision**—Displays the firmware revision level of the tape drive. Use this value for identification purposes.
- **Serial Number**—Displays the unit serial number for the tape drive. Use this value for identification purposes.

**NOTE:** Not all tape devices support serial numbers.

- **Protocol Type**—Displays the protocol used to communicate with the tape drive. The following values are valid:
    - **Parallel SCSI**—The protocol is Parallel SCSI.
    - **Serial ATA**—The protocol is Serial ATA.
    - **SAS**—The protocol is Serial Attached SCSI.
    - **Unknown**—The Storage Agents are unable to determine the protocol.
- **Current Width**—Displays the current negotiated data transfer width for Parallel SCSI tape drives. The possible values are:
    - **Narrow (8 bits)**—The negotiated data transfer width for this drive is narrow (8 data bits).
    - **Wide (16 bits)**—The negotiated data transfer width for this drive is wide (16 data bits).
    - **Unknown**—The Storage Agents are unable to determine the current negotiated data transfer width for this drive.
- **Current Speed**—Displays the current negotiated data transfer speed for Parallel SCSI tape drives. The possible values are:
    - **Asynchronous**—The current data transfer speed for this drive is asynchronous.
    - **Fast**—The current data transfer speed for this drive is 10 million transfers per second.
    - **Ultra**—The current data transfer speed for this drive is 20 million transfers per second.
    - **Ultra2**—The current data transfer speed for this drive is 40 million transfers per second.
    - **Ultra3**—The current data transfer speed for this drive is 80 million transfers per second.
    - **Unknown**—The agent is unable to determine the current negotiated data transfer speed for this drive.

**NOTE:** If the current data transfer width is Narrow (8 bits) then the speed in megabytes per second is equal to the million transfers per second speed. If the current width is Wide (16 bits) then the speed in megabytes per second is twice the million transfers per second speed. For example, if the current speed is Ultra and the width is Wide then the speed would be 40 megabytes per second.

- **Negotiated Link Rate**—Displays the negotiated link rate for SAS and SATA tape drives. The possible values are:
    - **1.5 Gbps**—The negotiated link rate for this drive is 1.5 gigabits per second.
    - **3.0 Gbps**—The negotiated link rate for this drive is 3.0 gigabits per second.
    - **Unknown**—The agent is unable to determine the negotiated link rate for this tape drive.
- **Magazine Size**—Displays the magazine size of autoloader tape drives. For single tape devices, the magazine size is N/A.
- **Placement**—Indicates whether the tape drive is in an internal or external storage system. The following values are valid:
- **Internal**—The tape drive is in an internal storage system.
- **External**—The tape drive is in an external storage system.
- **Unknown**—The tape drive is not in a storage system or the Storage Agents cannot determine the drive placement.

↕—This symbol indicates that the drive is a hot-plug drive.

- **Library Drive**—Indicates whether the tape drive is included in a tape library. The following values are valid:
    - **Yes**—The tape drive is included in a tape library.
    - **No**—The tape drive is not included in a tape library.
    - **Unknown**—The Storage Agents are unable to determine if the tape drive is included in a tape library.

- **Tape Errors**—Displays the total number of read and write errors encountered. This value is maintained from the moment the Tape Hardware Interface driver was loaded.

  Tape errors may occasionally occur. If this value rises dramatically, clean the device. If you continue to have errors, you may have a problem. Some common causes of these errors include radio frequency interference (RFI) on the bus cables, bad or missing terminating resistors on the drives, or having more than one device with the same SCSI ID. Ensure the bus cable is free of obstructions and that the devices on the bus are properly configured.

- **Uncorrectable**—isplays the total number of read and write errors which could not be corrected. This value is maintained from the moment the Tape Hardware Interface driver was loaded.

  Uncorrectable errors may occasionally occur. If this value rises dramatically, clean the device. If you continue to have errors, you may have a problem. Some common causes include radio frequency interference (RFI) on the bus cables, bad or missing terminating resistors on the drives, or having more than one device with the same SCSI ID. Ensure the bus cable is free of obstructions and that the devices on the bus are properly configured.

- **Rereads**—Displays the number of times blocks that had to be reread from the device. This value is maintained from the moment the Tape Hardware Interface driver was loaded.

  Reread errors may occasionally occur. If this value rises dramatically, clean the device. If you continue to have rereads, you may have a problem. Some common causes include radio frequency interference (RFI) on the bus cables, bad or missing terminating resistors on the drives or having more than one device with the same SCSI ID. Ensure the bus cable is free of obstructions and that the devices on the bus are properly configured.

- **Rewrites**—Displays the number of times blocks that had to be rewritten to the device. This value is maintained since the Tape Hardware Interface driver was loaded.

  Rewrite errors may occasionally occur. If this value should rise dramatically, you may need to clean the device. If you continue to have rewrites, you may have a problem. Some common causes include radio frequency interference (RFI) on the bus cables, bad or missing terminating resistors on the drives, or having more than one device with the same SCSI ID. Ensure the bus cable is free of obstructions and that the devices on the bus are properly configured.

- **Total bytes**—Displays the cumulative total number of bytes the tape drive has processed.

- **Tape Drive Heads Need Cleaning**—Indicates whether the tape drive need to be cleaned. To clean the tape heads, insert a cleaning tape into the drive and run through a cleaning cycle. The following values are valid:

  - **Yes**—The tape drive requires a cleaning tape session in order to clean the heads.
  - **No**—The tape drive does not require any cleaning tape session.
  - **Not Supported**—The tape drive does not support monitoring of the cleaning required status.

- **Cleaning Tape Needs Replacement**—Indicates whether the cleaning tape that is inserted in an autoloader needs to be replaced because its cleaning capability is exhausted (it is at the end of the tape). This variable can be in one of the following states:

  - **Yes**—The autoloader tape drive requires a new cleaning tape to be inserted.
  - **No**—The tape drive does not require a new cleaning tape.
  - **Not Supported**—The tape drive does not support monitoring of the cleaning tape replacement status.

📝 **NOTE:** This variable is only applicable to autoloader tape drives.

## Storage Systems

For more information on storage systems, see the product information on the HP website **https://www.hp.com**.

Storage system information is listed below:

- **Box Type**—Displays the type of drive enclosure, or box. The following types are possible:
- **External Storage System**—Outside the machine
- **Internal Storage System**—Inside the machine
- **Unknown**—The Storage Agents do not recognize the drive enclosure. You may need to upgrade your software.
- **Vendor**—Displays the name of the vendor that produces this drive enclosure, or box type. Use this information for identification purposes.
- **Firmware Revision**—Displays the firmware revision of the drive enclosure or box. Use this information for identification purposes.
- **Serial Number**—Displays the serial number of the drive enclosure or box. Use this information for identification purposes.

- **Fan Status**—Displays the status of the fan subsystem in the drive enclosure, or box. The following values are possible:
- **OK**—The fan subsystem is working properly.
- **Failed**—A fan has failed and there are not enough fans in the fan subsystem to keep the enclosure cool. Check your fan subsystem as soon as possible. Continued operation may cause failure of the drives.
- **Degraded**—A fan has failed but there are still enough fans in the fan subsystem to keep the enclosure cool.
- **Unknown**—The Storage Agents do not recognize the status of the fan subsystem. You may need to upgrade your software.
- **No Fan**—This storage system does not have a fan.
- **Backplane Speed**—Displays the speed of the storage system backplane. The following values are possible:
    - **Ultra3**—The storage system is capable of Ultra3 speeds.
    - **Ultra320**—The storage system is capable of Ultra320 speeds.
    - **Unknown**—The Storage Agents are unable to determine the storage system backplane speed. You may need to upgrade your software.
- **Connection Type**—Displays the type of connection between the server and the box. The following values are possible:
    - **Fibre Attached**—This chassis is attached to the server through Fibre Channel.
    - **SCSI Attached**—This chassis is attached to the server with a SCSI cable.
    - **SAS Attached**—This chassis is attached to the server with a SAS cable.
    - **Unknown**—The Storage Agents are unable to determine the type of connection.
- **Drive Bays**—Displays the number of drive bays provided by this storage system. If duplexing hardware is used with the storage system, the drive bay number is less than the number of physical drive bays in the enclosure.
- **Model**—isplays the model of the storage system. Use this information for identification purposes.
- **Board Revision**—Displays the board revision level of this storage system backplane.
- **Thermal Status**—Displays the temperature status of the drive system. The following values are possible:
    - **OK**—The temperature is within normal operating range.
    - **Degraded**—The temperature is outside of normal operating range. Check to make sure the cover is on the storage system.
    - **Failed**—The temperature is outside of normal operating range, and could permanently damage the system. Ensure that the fans are spinning, and check the room temperature.
    - **Unknown**—The Storage Agents do not recognize the thermal status. You may need to upgrade your software.
- **No Temperature Monitoring**—This storage system does not support temperature monitoring.
- **Side Panel**—Displays the status of the side panel of the drive enclosure, or box. The following values are possible:
    - **In Place**—The side panel is closed.
    - **Removed**—The side panel is not in place or not completely closed.
    - **Unknown**—The Storage Agents do not recognize the side panel status. You may need to upgrade your software.
- **No Panel Detection**—This storage system does not support side panel detection.
- **Duplex Option**—Displays the duplex option installed in this storage system. The following values are possible:
    - **Duplex Top**—This storage system is the top part of a duplexed unit.
    - **Duplex Bottom**—This storage system is the bottom part of a duplexed unit.
    - **None**—A duplex option is not installed.
- **Power Supply Status**—Displays the status of the redundant power supply. The following values are possible:
    - **OK**—All component power supplies that make up the redundant power supply are in normal working order.
    - **Degraded**—One of the component power supplies that make up the redundant power supply has failed. The drive system (either a drive subsystem or a power supply for the main unit) continues to operate; however, if the remaining power supply should fail, the drive system loses power and data loss could occur. To correct this situation, schedule a time to bring the device down and replace the failed power supply.
    - **Unknown**—The Storage Agents do not recognize the redundant power supply. You may need to upgrade your software.
- **No Redundant Power Supply**—This ProLiant server does not support a redundant power supply.
- **Paths**—Displays the status and role of each data path to the storage system (for multipath capable hardware only). The following values are possible:

- **Path**—Indicates the path to the storage system. Each path is identified by a descriptor. For example, "Port 2E Box 1" indicates a path from the host adapter external port number 2 ("Port 2E") to the first box.
- **Status**—Indicates the status of the data path. Possible values are:
  - **OK**—The path is operational.
  - **Link down**—The path is not operational.
  - **Unknown**—The path status cannot be determined.
  - **Role**—Indicates the role of this path in the configuration. Possible values are:
  - **Active**—This path is the preferred data path to the storage system.
  - **Alternate**—This path is the alternate data path to the storage system.
  - **Unknown**—The role of this path cannot be determined.

## IDE controllers

Select an IDE controller entry from the Mass Storage list to display a submenu containing separate entries for IDE controller information, IDE ATA disk drives connected to the controller, and IDE ATAPI devices connected to the controller. Device types include disks, DVD/CD-ROM drives, tape drives, processors, scanners, optical drives, WORM drives, and so on. The following items might appear depending on the type of controller:

- IDE controller information
- IDE ATAPI devices
- IDE ATA disk drives
- IDE ATA logical drives

## IDE controller information

Select a controller entry from the Mass Storage list to display the following information:

- **Model**—Displays the controller's model string, used for identification purposes
- **Slot**—Displays the physical slot number where the controller is installed in the system or N/A if slot number is not available
- **Firmware Version**—Displays the firmware version of the controller

## IDE ATAPI devices

The information displayed for each IDE ATAPI device entry in the submenu includes condition graphic and device location: Primary or Secondary channel, Master device 0 or Slave device 1. If the Storage Agents cannot determine the channel then "Channel unknown" displays. If the device position cannot be determined, "Device unknown" displays and the driver software or the Storage Agents might need to be updated. Select any of the devices from the submenu to display more information about the devices. The following information displays for all devices:

- **Device Type**—Identifies the type of ATAPI device. The following values are valid:
  - **Disk**—A direct-access device, such as a disk drive.
  - **Removable Media Disk**—A removable media device, such as a floppy disk drive.
  - **Tape**—A sequential-access device, such as a tape drive.
  - **Printer**—A printer device.
  - **Processor**—An operating device, such as a central processing unit or ProLiant Storage System.
  - **WORM drive**—A write-once, read-many times device.
  - **DVD/CD-ROM**—A DVD-ROM or CD-ROM device. It can be a read-only device or a read-write device.
  - **PD-CD Drive**—A combination CD-ROM drive and removable media read-write drive.
  - **Scanner**—A scanning device.
  - **Optical**—An optical memory or storage device.
  - **Jukebox**—A media-changer device, such as a tape or CD library.
  - **Communications Device**—A communications device, such as a LAN bridge.
  - **Unknown**—The Storage Agents could not determine the device type. You might need to upgrade your support software or Storage Agents.
- **Model**—Displays the model of the device.
- **Firmware Revision**—Displays the firmware version of the device.

## IDE ATA disk drives

The information displayed for each IDE ATA disk drive entry in the submenu includes condition graphic and disk drive location: Primary or Secondary channel, Master device 0 or Slave device 1. If the Storage Agents cannot determine

the channel, then "Channel unknown" displays. If the device position cannot be determined, then "Device unknown" displays and driver software or the Storage Agents might need to be updated. Select any of the disk drives from the submenu to display more information about the disk drives.

The following information is displayed for all disk drives:

- **Model**—Displays the model of the disk drive.
- **Status**—Displays the current status of the disk drive. The following values are valid:
  - **OK**—The disk drive is operating normally.
  - **S.M.A.R.T. Error**—The S.M.A.R.T. predictive failure monitoring predicts imminent failure of this disk drive. Schedule replacement before actual failure occurs.
  - **Failed**—The disk drive has failed and must be replaced.
  - **Unknown**—The Storage Agents cannot determine the status of the disk drive. You might need to upgrade your driver software or Storage Agents.
- **S.M.A.R.T. Support**—Indicates whether S.M.A.R.T. support is available for this disk drive. The following values are valid:
  - **Available**—This drive supports predictive failure monitoring.
  - **Not Available**—This drive does not support predictive failure monitoring.
  - **Unknown**—The Storage Agents cannot determine if the drive supports predictive failure monitoring. You might need to upgrade your driver or Storage Agents.
- **Serial Number**—Displays the serial number of the disk drive.
- **Firmware Revision**—Displays the firmware version of the disk drive.
- **Capacity (MB)**—Displays the capacity of the drive in megabytes. For example, 210 identifies a 210-megabyte drive. A megabyte is defined as 1,048,576 bytes. The capacity value shown might differ from the stated size of the drive due to different definitions of a megabyte. Many hardware manufacturers use the value of 1,000,000 for megabyte instead of 1,048,576.
- **Transfer Mode**—Displays the data transfer mode of the disk drive. The following values are valid:
  - **PIO Mode 0**—The data transfer mode is programmed input/output mode 0.
  - **PIO Mode 1**—The data transfer mode is programmed input/output mode 1.
  - **PIO Mode 2**—The data transfer mode is programmed input/output mode 2.
  - **PIO Mode 3**—The data transfer mode is programmed input/output mode 3.
  - **PIO Mode 4**—The data transfer mode is programmed input/output mode 4.
  - **DMA Mode 0**—The data transfer mode is direct memory access mode 0.
  - **DMA Mode 1**—The data transfer mode is direct memory access mode 1.
  - **DMA Mode 2**—The data transfer mode is direct memory access mode 2.
  - **Ultra DMA Mode 0**—The data transfer mode is ultra direct memory access mode 0.
  - **Ultra DMA Mode 1**—The data transfer mode is ultra direct memory access mode 1.
  - **Ultra DMA Mode 2**—The data transfer mode is ultra direct memory access mode 2.
  - **Ultra DMA Mode 3**—The data transfer mode is ultra direct memory access mode 3.
  - **Ultra DMA Mode 4**—The data transfer mode is ultra direct memory access mode 4.
  - **Ultra DMA Mode 5**—The data transfer mode is ultra direct memory access mode 5.
  - **Unknown**—The Storage Agents cannot determine the disk drive data transfer mode.

## Logical drives

This is a list of logical drives that includes this physical drive as a member. Select one of the listed logical drives to see more information about the drive.

## IDE ATA logical drives

A list of logical drives associated with the controller displays in the Mass Storage submenu. Each logical drive in the list displays the condition, logical drive number and the fault tolerance of that logical drive. Select one of the logical drive entries to display the following information.

- **Status**—Displays the status of the logical drive. The logical drive can be in one of the following states:
  - **OK**—Indicates that the logical drive is in normal operation mode.
  - **Degraded**—Indicates that at least one physical drive has failed, but the logical drive's RAID level lets the drive continue to operate with no data loss.

- **Rebuilding**—Indicates that the logical drive is rebuilding a physical drive. When complete, the logical drive returns to normal operation.
- **Failed**—Indicates that more physical drives have failed than the RAID level of the logical drive can handle without data loss.
- **Unknown**—The agent cannot determine the logical drive status. You might need to upgrade your software.
- **Fault Tolerance**—Displays the fault tolerance mode of the logical drive. The following values are valid:
  - **RAID 0**—Fault tolerance is not enabled. Data loss occurs for that logical drive if one physical drive fails.
  - **RAID 1**—Drive mirroring is the highest level of fault tolerance. It is the only method offering fault tolerance protection if no more than two physical drives are selected. Drive mirroring creates fault tolerance by storing duplicate data on two drives. This is the most costly fault tolerance method because it requires 50 percent of the drive capacity to store the redundant data. If a physical drive fails, the mirror drive provides a backup copy of the files and normal system operations are not interrupted.
  - **RAID 0+1**—Drive mirroring is the highest level of fault tolerance. There must be four drives for RAID 0+1. This is the most costly fault tolerance method because it requires 50 percent of the drive capacity to store the redundant data. If a physical drive fails, the mirror drive provides a backup copy of the files and normal system operations are not interrupted. This mirroring feature can withstand multiple simultaneous drive failures as long as the failed drives are not mirrored to each other.
  - **Unknown**—The agent cannot determine the RAID level of this logical drive. You might need to upgrade your software.
- **Capacity**—Displays the size of the logical drive in megabytes. For example, 120 indicates that the logical drive is 120 megabytes. Use this data to determine whether the drive is large enough to accommodate your needs.

  The capacity utility defines a megabyte as 1,048,576 bytes. The capacity value shown might differ from the stated size of the drive due to different definitions of a megabyte. Many hardware manufacturers use the value of 1,000,000 for megabyte instead of 1,048,576.
- **Stripe Size**—Displays the size of a logical drive stripe in kilobytes.
- **Disk Rebuilding**—Identifies the physical drive that is being rebuilt. The identity of the physical drive only displays when the status of the logical drive is Rebuilding, otherwise, N/A displays.

## Physical drives

This is a list of physical drives that make up the logical drive. Select one of the listed physical drives to see more information about the drive.

## Spare drives

This is a list of physical drives that can be used to replace a failed physical drive if the fault tolerance mode is RAID 1 or RAID 0+1. Select one of the listed spare drives to see more information about the drive.

## SCSI controllers

Select a SCSI controller entry from the Mass Storage list to display a submenu containing separate entries for Controller Information, SCSI devices connected to the controller, and Storage System information. Device types include disks, DVD/CD-ROM drives, tape drives, processors, tape libraries, CD libraries, scanners, optical drives, WORM drives, and so on. The following items might be displayed depending on the type of controller:

- Controller information
- SCSI device information
- Tape library
- Tape devices
- CD storage system
- Storage Systems
- SCSI physical drives
- SCSI logical drives
- SCSI bus information

## Controller information

Select a controller entry from the Mass Storage list to display the following information:

- **Model**—Displays the controller's model ID, used for identification purposes. The following values are valid:
  - Compaq 32-Bit Fast-SCSI-2 Controller
  - Compaq Systempro/XL Integrated SCSI-2 Port
  - Compaq Integrated Fast SCSI-2/P Controller

- Compaq 32-Bit Fast-Wide SCSI-2/E Controller
- Compaq 32-Bit Fast-Wide SCSI-2/P Controller
- Compaq Wide-Ultra SCSI Controller
- Compaq Wide-Ultra2 SCSI Controller
- Compaq 64-Bit Dual Channel Wide-Ultra2 SCSI Controller
- Compaq Wide Ultra3 SCSI Adapter
- HP 64-Bit/133MHz PCI-X 2CH Ultra320 HBA
- The StorageWorks Library Adapter
- Third-party SCSI Controller Model
- **Unknown**—The driver software or storage agents might need to be upgraded, or you have a SCSI controller in the system that the Storage Agents do not recognize.
- **Status**—Displays the current status of the controller. The following values are valid:
  - **OK**—The controller is operating normally.
  - **Failed**—The controller has failed and is no longer operating.
  - **Unknown**—You might need to upgrade your driver software or Storage Agents or the Storage Agents cannot determine the status of the controller.
- **Serial Number**—Displays the serial number of the SCSI controller. This number can be used for identification purposes.
- **Firmware Version**—Displays the SCSI controller's BIOS firmware version number. This information is not available for all SCSI controllers.
- **Bus Width**—Displays the physical width of the data transfer bus of the SCSI controller. The following values are valid:
  - **Narrow (8 bits)**—The controller supports a narrow 8-bit data transfer bus.
  - **Wide (16 bits)**—The controller supports a wide 16-bit data transfer bus.
  - **Unknown**—The agent is unable to determine the physical width of the data transfer bus. You might need to upgrade your software.
- **Hard Resets**—Displays the number of times the SCSI Hardware Interface Driver detected that the SCSI bus has been reset since the driver was loaded.

  Hard resets occasionally occur due to device errors. If this value rises dramatically, there might be a problem. Review the SCSI bus information for unusually high error counts. A device with a large number of bus errors might be failing and require replacement.
- **Soft Resets**—Displays the number of times the SCSI Hardware Interface Driver has issued a reset command to all devices on a SCSI bus since the driver was loaded. Soft resets occur when the device driver is initializing the SCSI bus for operation or when device errors have left the bus in an ambiguous, nonoperational state.

  If this value rises dramatically, there might be a problem. Review the SCSI Bus Information for unusually high error counts. If there is a device with a large number of bus errors, it might be failing and require replacement.
- **Timeouts**—Displays the number of times the SCSI Hardware Interface Driver issued a SCSI command but did not receive a reply within a specific amount of time. This count is kept from the time the driver was loaded.

  Timeouts might occur when a device fails to process a request because the SCSI bus was busy. However, if this value rises dramatically, there might be a problem. Verify that non-disk SCSI devices (such as tape drives) reside on the SCSI bus with the drives. Non-disk devices can require the SCSI bus for long periods, resulting in timeouts.

## SCSI device information

The information displayed for each SCSI device entry in the submenu includes condition graphic, location (SCSI ID), and device type. Select any of the physical devices from the submenu to display more information about the device.

The following information is a list of device types and the information displayed for all SCSI devices:

- **Device Type**—Identifies the type of SCSI device. The following values are valid:
  - **Disk**—A direct-access device, such as a disk drive.
  - **Removable Disk**—A removable media device, such as a floppy disk drive.
  - **Tape**—A sequential-access device, such as a tape drive.
  - **Printer**—A printer device.
  - **Processor**—An operating device, such as a central processing unit or ProLiant Storage System.
  - **WORM drive**—A write-once, read-many times device.
  - **DVD/CD-ROM**—A DVD-ROM or CD-ROM device. It can be a read-only device or read-write device.

- **Power Drive CD-ROM**—A storage device that can read from a CD and write to or read from an optical disk.
- **CR3500 RAID Controller**—A three-channel SCSI RAID controller.
- **Scanner**—A scanning device.
- **Optical**—An optical memory or storage device.
- **Jukebox**—A media-changer device, such as a jukebox.
- **Tape Library**—A tape library or autoloader device.
- **Communications Device**—A communications device, such as a LAN bridge.
- **Unknown**—You might need to upgrade your support software or Storage Agents.

The following items returned by the SCSI inquiry command can be used for identification purposes:

- **Vendor**—Displays the vendor's name for the SCSI device
- **Model**—Displays a description of the SCSI device model
- **Firmware Version**—Displays the firmware revision level of the SCSI device

## Tape library

Select a tape library entry in the SCSI controller submenu to display a list of information and status associated with the selected tape library. The following information is displayed:

- Status—Displays the current status of the tape library. The following values are valid:
  - **OK**—Indicates that the library is in normal operation mode. No user action is necessary.
  - **Degraded**—Indicates that the library has degraded in some manner.
  - **Failed**—Indicates that the library has failed and can no longer return data. The library might need to be replaced.
  - **Offline**—Indicates that the Storage Agents can no longer communicate with the library. This could be caused by a cabling problem or the library might be powered off.
  - **Unknown**—The status of the tape library cannot be determined. Ensure the latest drivers and Storage Agents are installed.
- **Model**—Displays the tape library model.
- **Serial Number**—Displays the unit serial number for the library. It can be used for identification purposes.
- **Firmware Version**—Displays the firmware revision level of the tape library as returned by the SCSI inquiry command.
- **Service Hours**—Displays the number of hours in service.
- **Total Moves**—Displays the total number of moves.
- **Door Status**—Displays the tape library door status. The following values are valid:
  - **Open**—Indicates that the tape library door is open.
  - **Closed**—Indicates that the tape library is closed.
  - **Not supported**—Indicates that the tape library does not detect or report door status.
  - **Unknown**—The door status of the tape library cannot be determined. Ensure the latest drivers and Storage Agents are installed.
- **Temperature**—Displays the tape library temperature status. The following values are valid:
  - **OK**—Indicates that the temperature of the library is within normal operating limits.
  - **Safe Temperature Exceeded**—Indicates that the temperature of the library has exceeded the safe operational temperature. The library continues to operate under this warning.
  - **Maximum Temperature Exceeded**—Indicates that the temperature of the library has exceeded the normal operating limits to the extent that the library might no longer function.
  - **Not supported**—Indicates that the library cannot detect or report the temperature status.
  - **Unknown**—The temperature status of the tape library cannot be determined. Ensure the latest drivers and Storage Agents are installed.
- **Redundancy**—Displays the tape library redundancy status, which denotes the presence of internal redundant components, such as fans, power supplies, etc. The following values are valid:
  - **Active**—Indicates that the library is capable of detecting and reporting redundant components, there are enough redundant units installed, and redundancy is active.
  - **Capable**—Indicates that the library is capable of detecting and reporting redundant components but there are not enough redundant units installed to make redundancy active.
  - **Not capable**—Indicates that the library is capable of detecting and reporting redundant components but there are no components that support redundancy.

- **Not supported**—Indicates that the library cannot detect or report redundancy status.
- **Unknown**—The redundancy status of the tape library cannot be determined. Ensure the latest drivers and Storage Agents are installed.
- **Hot Swap**—Displays the tape library hot swap status which denotes the presence of hot swappable internal components, such as drives, fans, power supplies, etc. The following values are valid:
  - **Capable**—Indicates that the library is capable of detecting and reporting hot-swappable internal components and has at least one hot-swappable component.
  - **Not capable**—Indicates that the library is capable of detecting and reporting hot swappable internal components but there are no hot-swappable components installed.
  - **Not supported**—Indicates that the library cannot detect or report hot-swap status.
  - **Unknown**—The hot-swap status of the tape library cannot be determined. Ensure the latest drivers and Storage Agents are installed.
- **Last Known Error**—Displays the hexadecimal error status code including text information, if available. For details, see the hardware documentation for more information.
- **Associated Tape Drives**—Displays a list of tape drives associated with the tape storage system.

## Tape devices

Select a tape device entry in the SCSI controller submenu to display a list of information and status associated with the selected tape device. The following information is displayed:

- **Status**—Displays the status of the SCSI Tape drive that you selected. The following values are valid:
  - **OK**—Indicates the tape drive is operating normally.
  - **Failed**—Indicates the tape drive has failed and might need to be replaced.
  - **Offline**—Indicates the tape drive is offline and can no longer return data. No further status is available.
  - **Missing**—Was OK—Indicates a tape drive that was located in the system and had a status of OK, which has been removed.
  - **Missing—Was Failed**—Indicates a tape drive that was located in the system and had a status of failed has been removed.
  - **Missing—Was Offline**—Indicates a tape drive that was located in the system and had a status of offline has been removed.
  - **Unknown**—The Storage Agents cannot determine the status of this tape drive. You might need to upgrade your driver software or Storage Agents.
- **Model**—Displays a description of the SCSI tape device model as returned by the SCSI inquiry command. Use this item for identification purposes.
- **Firmware Version**—Displays the firmware revision level of the tape device as returned by the SCSI inquiry command.
- **Serial Number**—Displays the serial number assigned to the tape device. This value is based on the serial number as returned by the SCSI inquiry command, but might have been shortened because of space limitations. Use this item for identification purposes.

**NOTE:** Not all tape devices support serial numbers.

- **Placement**—Indicates whether the physical drive is in an internal or external storage system. The following values are valid:
  - **Internal**—The physical drive is in an internal storage system.
  - **External**—The physical drive is in an external storage system.
  - **Unknown**—The physical drive is not in a storage system or the Storage Agents cannot determine the drive placement.

—This symbol indicates that the drive is a hot-plug drive.

- **Library Drive**—Indicates whether the tape drive is included in a tape library. The following values are valid:
  - **Yes**—The tape drive is included in a tape library.
  - **No**—The tape drive is not included in a tape library.
  - **Unknown**—The Storage Agents are unable to determine if the tape drive is included in a tape library.
- **Media Changer Information**—Displays the autoloader media changer information. This only displays when the tape device is an autoloader.

- **Model**—Displays a description of the SCSI tape autoloader media changer model as returned by the SCSI inquiry command.
- **Firmware Version**—Displays the firmware revision level of the tape autoloader media changer as returned by the SCSI inquiry command.
- **Serial Number**—Displays the serial number assigned to the tape autoloader media changer. This value is based on thee serial number as returned by the SCSI inquiry command.
- Magazine Size—Displays the magazine size of the SCSI tape autoloader media changer.
- **Tape Errors**—Displays the number of read and write errors that have been encountered with the currently loaded tape. Over time, a tape device might produce these errors. These errors are usually caused by bad media sections on the drive. If this value rises dramatically, you might need to clean the device.

**NOTE:** The number of tape errors is equal to or greater than the combined total for re-reads, re-writes and uncorrectable errors.

- **Re-reads**—Displays the number of read errors corrected through tape drive retries. Over time, all drives produce these errors. If you notice a rapid increase in the value for Recovered Read Errors or Hard Read Errors, a problem might exist with the drive. The value increases every time the physical drive detects and corrects another error. If this value rises dramatically, you might need to clean the device.
- **Re-writes**—Displays the number of write errors corrected through tape drive retries or other drive recovery mechanisms. Over time, all drives produce these errors.

  Having a large number of retry corrected errors does not necessarily indicate that the drive is failing. However, as a precaution, replace a drive that has an abnormally high amount of errors when compared to similar drives. If this count increases rapidly, you might need to clean or replace the drive.
- **Uncorrectable**—Displays the number of read errors that could not be recovered by a tape drive's ECC algorithm, retries, or any other recovery mechanism. Over time, a drive might produce these errors. These errors are usually caused by bad media sections on the tape.
- **Tape Drive Heads Need Cleaning**—Indicates the tape heads on the drive must be cleaned. If they must be cleaned, a cleaning tape must be placed in the drive or the autoloader.

**NOTE:** A value of Not Supported indicates that the tape drive does not support this feature. You might need to upgrade your firmware to the latest revision.

  As routine maintenance, the drive heads should be cleaned according to the recommended schedule for your specific drive.
- **Cleaning Tape Needs Replacement**—Indicates the cleaning tape associated with the autoloader is at the end of the tape. If the cleaning tape is at the end of the tape, a new cleaning tape must be placed in the autoloader.

**NOTE:** A value of "Not Supported" indicates that the tape drive does not support this feature. You might need to upgrade your firmware to the latest revision.

- **Number of Cleanings Performed**—Indicates the number of times that the tape drive has been cleaned. If a tape drive is cleaned too much it can damage the tape heads.

**NOTE:** A value of Not Supported indicates that the tape drive does not support this feature.

## CD storage system

Select the **CD Storage System** entry in the SCSI controller submenu to display Library Information and information for CD-ROM drives associated with the storage system.

## CD Library Information

Select the **Library Information** entry from the CD Storage System list to display the following information:

- **Status**—Displays the current fault light status of the CD Library. The following values are valid:
  - **OK**—The library is operating normally.
  - **Failed**—Indicates that the CD library fault light is in a failed state. The fault light is activated for hardware errors (Sense Code 04h) with additional Sense codes—40h-4fh except the parity error. The LED remains illuminated until it is power cycled.
  - **Unknown**—The state of the library cannot be determined.

- **Vendor**—Displays the vendor name for the CD Library. This item can be used for identification purposes.
- Model—Displays the model name of the CD Library. This value can be used for identification purposes.
- **Serial Number**—Displays the serial number of the CD Library. This value can be used for identification purposes.
- **Firmware Versio**n—Displays the firmware revision of the CD Library.

## CD-ROM drive information

Select a CD-ROM drive from the CD Storage System list to display the following information:

- **Vendor**—Displays the vendor name for the CD-ROM drive
- **Model**—Displays the model name of the CD-ROM drive
- **Firmware Rev**—Displays the firmware revision of the CD-ROM drive
- **LUN**—Displays the logical unit number of the CD-ROM drive

## Storage systems

Select a storage system item from the SCSI controller submenu to display the following information about ProLiant Storage Systems.

- **Box Type**—Displays the type of drive enclosure, or box. The following types of enclosures are possible:
  - **External Storage System**—Outside the machine.
  - **Internal Storage System**—Inside the machine.
  - **Unknown**—The Storage Agents do not recognize the drive enclosure. You might need to upgrade your software.
- **Vendor**—Displays the name of the vendor that produces this drive enclosure or box type. Use this information for identification purposes.
- **Model**—Displays the model of the storage system. Use this information for identification purposes.
- **Firmware Revision**—Displays the firmware revision of the drive enclosure or box. Use this information for identification purposes.
- **Board Revision**—Displays the board revision level of this storage system backplane.
- **Serial Number**—Displays the serial number of the drive enclosure or box. Use this information for identification purposes.
- **Thermal Status**—Displays the temperature status of the drive system. The following values are possible:
  - **OK**—The temperature is within normal operating range.
  - **Degraded**—The temperature is outside of normal operating range. Be sure the cover is on the ProLiant Storage System.
  - **Failed**—The temperature is outside of normal operating range, and could permanently damage the system. Ensure that the fans are spinning and check the room temperature.
  - **Unknown**—The Storage Agents do not recognize the thermal status. You might need to upgrade your software.
  - **No Temperature**—This server does not support temperature monitoring.
- **Fan Statu**s—Displays the status of the fan subsystem in the drive enclosure, or box. The following values are possible:
  - **OK**—The fan subsystem is working properly.
  - **Failed**—A fan has failed and there are not enough fans in the fan subsystem to keep the enclosure cool. Check your fan subsystem as soon as possible. Continued operation might cause failure of the drives.
  - **Degraded**—A fan has failed but there are still enough fans in the fan subsystem to keep the enclosure cool.
  - **Unknown**—The Storage Agents do not recognize the status of the fan subsystem. You might need to upgrade your software.
  - **No Fan**—This server does not have a fan.
- **Backplane Speed**—Displays the speed of the storage system backplane. The following values are possible:
  - **Ultra3**—The storage system is capable of Ultra3 speeds.
  - **Ultra320**—The storage system is capable of Ultra320 speeds.
  - **Unknown**—The Storage Agents are unable to determine the storage system backplane speed. You might need to upgrade your software.
- **Drive Bays**—Displays the number of drive bays provided by this storage system. If duplexing hardware is used with the storage system, the drive bay number is less than the number of physical drive bays in the enclosure.
- **Duplex Option**—Displays the duplex option installed in this storage system. The following values are possible:

- **Duplex Top**—This storage system is the top part of a duplexed unit.
  - **Duplex Bottom**—This storage system is the bottom part of a duplexed unit.
  - **None**—A duplex option is not installed.
- **Power Supply Status**—Displays the status of the Redundant Power supply. The following values are possible:
  - **OK**—All component power supplies that make up the redundant power supply are in normal working order.
  - **Degraded**—One of the component power supplies that make up the redundant power supply has failed. The drive system (either a drive subsystem or a power supply for the main unit) continues to operate. However, if the remaining power supply should fail, the drive system loses power and data loss could occur. To correct this situation, schedule a time to bring the device down and replace the failed power supply.
  - **Unknown**—The Storage Agents do not recognize the redundant power supply. You might need to upgrade your software.
  - **No Redundant Power Supply**—This ProLiant server does not support a redundant power supply.

## SCSI physical drives

Select a SCSI physical drive from the SCSI controller submenu to display the following information:

- **Status**—Displays the status of the physical drive selected. The following values are valid:
  - **OK**—The physical drive is operating normally.
  - **Failed**—The physical drive has failed and can no longer return data. The drive might need to be replaced.
  - **Not Configured**—The physical drive is not configured. Ensure that all of the drive switches are properly set.
  - **Bad Cable**—A physical drive is not responding. Check the cables connected to the drive.
  - **Predictive Failure**—One of the physical drive thresholds has been exceeded.
  - **Offline**—The physical drive is offline and can no longer return data. No further status is available.
  - **Missing was OK**—A physical drive that was located in the system and had a status of OK has been removed.
  - **Missing was Failed**—A physical drive that was located in the system and had a status of failed has been removed.
  - **Missing was Predictive Failure**—A physical drive that was located in the system and had a status of Predictive Failure has been removed.
  - **Missing was Offline**—A physical drive that was located in the system and had a status of offline has been removed.
  - **Unknown**—The Storage Agents cannot determine the status of this drive. You might need to upgrade your driver software or Storage Agents.

📝 **NOTE:** OK, Predictive Failure, and Unknown are the only values associated with clients.

- **Action**—Displays the action that is required for this device. The possible values are valid:
  - **Replace Drive**—Replace this drive.
  - **Replace S.M.A.R.T. Drive**—A S.M.A.R.T. hard drive predicts imminent failure. Schedule replacement before actual failure.
  - **No Action Required**—The drive is operating normally and no action is required.
- **Capacity**—Displays the size of the physical drive in megabytes. A megabyte is 1,048,576 bytes.
  Many hardware manufacturers use a megabyte value of 1,000,000 instead of 1,048,576. This might result in discrepancies between the manufacturer's stated size and the size reported by this application.
- **Model**—Displays the model of the SCSI physical drive.
- **Firmware Version**—Displays the firmware revision level of the SCSI physical drive.
- **Serial Number**—Displays the serial number assigned to the physical drive. This value is based on the serial number as returned by the SCSI inquiry command, but might have been shortened due to space limitations. Use this item for identification purposes.
- **Service Hours**—Displays the total number of hours that a physical drive has been operating. If physical drive statistics are being saved across power cycles (check the SCSI Drive Statistics Preserved), then this value has been kept since the physical drive was installed. Otherwise, this value has been kept since the driver was loaded.
- **S.M.A.R.T. Support**—Indicates if S.M.A.R.T. support is available for this SCSI drive. The following values are valid:
  - **Not Available**—Predictive failure monitoring is not available for this drive.

- **Available**—This drive supports predictive failure monitoring.
- **Unknown**—The Storage Agents cannot determine if the drive supports predictive failure monitoring. You might need to upgrade your driver or Storage Agents.

- **Placement**—Indicates if the physical drive is in an internal or external storage system. The following values are valid:
  - **Internal**—The physical drive is in an internal storage system.
  - **External**—The physical drive is in an external storage system.
  - **Unknown**—The physical drive is not in a storage system or the Storage Agents cannot determine the drive placement.

⬍—This symbol indicates that the drive is a hot-plug drive.

- **Rotational Speed**—Indicates the rotational speed of the drive in revolutions per minute.

## Drive indicators

Select a SCSI physical drive from the SCSI controller submenu to display information on actions to take when a SCSI physical drive is not operating properly.

Use the Predictive Indicators to predict that a drive, is now operating normally, might need to be replaced. The numerical data associated with these items displays after the item name. For example, "Used Realloc: 122" indicates that there are 122 used reallocation sectors for this drive. The Predictive Indicators are as follows:

- **Used Reallocs**—Displays the number of sectors of the reallocation area that have been used by the physical drive.

  Because of the nature of magnetic disks, certain sectors on a drive might have media defects. The reallocation area is part of the drive that the drive manufacturer sets aside to compensate for these defects. The controller writes information addressed from these unusable sectors to available sectors in the reallocation area. If too many sectors have been reallocated, there might be a problem with the drive. The number of reallocation sectors reserved for this purpose is drive-specific, and you must contact the drive vendor for these values.

- **Spinup Time**—Monitors the time it takes for a physical drive to spin up to full speed.

  Drives require time to gain momentum and reach operating speed. As cars are tested to go from 0 mph to 60 mph in X number of seconds, drive manufacturers have preset expectations for the time it takes the drive to spin to full speed. Drives that do not meet these expectations might have problems. If this value increases over time, the drive might be having problems spinning up. Replace the drive as a precaution.

  The spinup value is shown in tenths of a second. If the drive takes 12 seconds to spin up, the value would be 120. The value might be 0 if you are monitoring a physical drive and you use a warm boot to reset the system. During a warm boot, the drives continue to spin.

- **Timeouts**—Displays the number of times that the SCSI Hardware Interface Driver issued a SCSI command but did not receive a reply within a specific amount of time. The count is kept from the time the driver was loaded. Timeouts might occur when a device fails to process a request because the SCSI bus was busy.

  If the count is greater than zero and the drive has failed, complete the following steps to attempt to correct the problem without replacing the drive:
  a. Ensure that all system and storage system cables are intact and seated properly. You might need to replace the cables.
  b. Be sure that the ProLiant Storage System is plugged in and powered on. Be sure the power supply is functioning.
  c. Check the physical proximity of the system to other electrical devices. Because electrical noise might cause a timeout error, check the AC circuit for other electrical devices.
  d. Timeouts can be caused when two or more drives are set to the same SCSI ID. Be sure that the ProLiant and system SCSI IDs do not conflict.
  e. On a ProLiant Storage System, check the SCSI ID cable on the drive tray. If the cable is damaged or incorrectly installed, SCSI Timeouts can occur. For more information, see the documentation accompanying the Hot-Plug Drive Tray Service Spare Kit.
  f. Be sure that the system temperature is within specified limits. Be sure that fans are operating and are not blocked.

  In some instances, drive failure can cause timeouts. If you continue to receive many of these errors, replace the drive.

- **Problem Indicator**—Use this utility to determine when a drive failure has occurred that might be correctable without replacing the drive. If the drive has failed and the problem indicator is non-zero, place your cursor over the field and press the **F1** key. The context-sensitive Help for the item includes information on correcting the problem.

- **Failure Indicator**—Use this utility to determine the cause of failure for a failed drive. If the drive has failed and this counter is non-zero, replace the drive. If the drive condition is OK and the failure indicator is not zero, the drive might have an intermittent problem and you might have to replace it. There is no other corrective action for this error.

- **Self-Test Errors**—Displays the number of times that a physical drive failed its self-test. The physical drive does a self-test each time the system is turned on. The number of self-test errors is counted from the time shown in the Service Hours item on the SCSI Physical Drive window.

   If the self-test error count is not zero and the drive has failed, replace the drive. If this count is non-zero, but the drive has not failed, it could signal an intermittent problem with the drive. If the number of errors increases over time, replace the drive.

## Drive statistics

Select a SCSI physical drive from the SCSI controller submenu to display statistics about a specific SCSI physical drive. You can use the run-time statistics to monitor the health of a specific drive. The following information displays:

- **Sectors Read**—Displays the total number of sectors read from the physical disk drive since the time listed in the Service Hours item in the SCSI Physical Drive section.

- **Sectors Written**—Displays the total number of sectors written to the physical disk drive since the time listed in the Service Hours item in the SCSI Physical Drive section.

**NOTE:** If sectors read and written are always zero or N/A on Microsoft Windows 2000 you must install Service Pack 2 or higher. You also must enable the logical and physical disk performance counters. Run `DiskPerf.exe -Y` in a command window and then reboot the system.

- **Hard Read Errors**—Displays the number of read errors that could not be recovered by a physical drive's ECC algorithm, retries, or any other recovery mechanism. These errors are counted over the time listed in the Service Hours item in the SCSI Physical Drive section.

   Over time, a drive might produce hard read errors. These errors are usually caused by bad media sections on the drive.

- **Hard Write Errors**—Displays the number of write errors that could not be recovered by physical drive retries. These errors are counted over the time listed in the Service Hours item in the SCSI Physical Drive section. Over time, a drive might produce these errors. These errors are usually caused by bad media sections on the drive.

   When a hard write error occurs, the physical drive remaps the bad sector. If the physical drive attempt to remap the sector is unsuccessful, NetWare Hot Fix Redirection logic attempts to remap the sector. Windows® NT hot fixes bad sectors on HPFS and NTFS file systems.

- **Recovered Read Errors**—Displays the number of read errors corrected through physical drive retries or other drive recovery mechanisms. Over time, all drives produce these errors. The number of errors is counted over the time shown in the Service Hours item in the SCSI Physical Drive section.

   Having a large number of retry corrected errors does not necessarily indicate that the drive is failing. However, as a precaution, you can replace a drive that has an abnormally high amount of errors when compared to similar drives. If the number of errors increases rapidly, you might need to replace the drive.

- **Recovered Write Errors**—Displays the number of write errors corrected through physical drive retries or other drive recovery mechanisms. Over time, all drives produce these errors. The number of errors is counted from the time shown in the Service Hours item in the SCSI Physical Drive section.

   Having a large number of retry corrected errors does not necessarily indicate that the drive is failing. However, as a precaution, you might wish to replace a drive that has an abnormally high amount of errors when compared to similar drives. If this count increases rapidly, you might need to replace the drive.

- **Seek Errors**—Displays the number of seek errors that a physical drive detects. A seek error is a seek that failed. The number of errors is counted over the time shown in the Service Hours item in the SCSI Physical Drive section.

   Seek errors occasionally occur. Having a large number of seek errors does not necessarily indicate that the drive is failing. However, as a precaution, you might wish to replace a drive that has an abnormally high amount of errors when compared to similar drives. If this count increases rapidly, you might need to replace the drive.

- **ECC Corr Read**s—Displays the number of times the drive used the ECC algorithm to recover data for read requests. The number of errors is counted over the time listed in the Service Hours item in the SCSI Physical Drive section.

   ECC-corrected reads occasionally occur over time. Having a large number of ECC-corrected errors does not necessarily indicate that the drive is failing. However, if a particular drive has an abnormally high amount of ECC-corrected reads compared to similar drives, you might replace the drive as a precaution. If this count increases rapidly, you might replace the drive.

# SCSI logical drives

Select a SCSI logical drive from the SCSI controller submenu to display the following information. The following values are valid:

- **Status**—Shows the status of the physical drive selected.
  - **OK**—The logical drive is in normal operation mode. No user action is required.
  - **Failed**—There are more failed physical drives than the fault tolerance mode of the logical drive can handle without data loss.
  - **Unconfigured**—The logical drive is not configured. Run the logical drive configuration utility to configure the logical drive.
  - **Recovering**—The logical drive is using Interim Recovery Mode. In Interim Recovery Mode, at least one physical drive has failed, but the logical drive's fault tolerance mode lets the logical drive continue to operate with no data loss. You should replace the failed drive as soon as possible.
  - **Ready for Rebuild**—The logical drive is ready for Automatic Data Recovery. The physical drive that failed has been replaced, but the logical drive is still operating in Interim Recovery Mode.
  - **Rebuilding**—The logical drive is currently re-synchronizing the data across the physical drives in the logical drive.
  - **Wrong Drive**—The wrong physical drive was replaced after a physical drive failure. You must return the drive incorrectly replaced and replace the failed drive.
  - **Bad Connection**—A physical drive is not responding. Check the cables connecting the physical drive.
  - **Degraded**—The logical drive is in a degraded state.
  - **Disabled**—The logical drive is disabled. The logical drive configuration utility can enable or disable the logical drive.
  - **Unknown**—The Storage Agents cannot determine the status of this drive. You might need to upgrade your driver software or Storage Agents.
- **Capacity**—Displays the size of the logical drive in megabytes. A megabyte is 1,048,576 bytes. Drive manufacturers sometimes use the number 1,000,000 as a megabyte when giving drive capacities so this value might differ from the advertised size of a drive.
- **Fault Tolerance**—Displays the fault tolerance mode of the logical drive. The following values are valid:
  - **None**—(RAID 0) fault tolerance is not enabled. If a physical drive reports an error, the data cannot be recovered.
  - **Mirroring**—(RAID 1/RAID 0+1) is the highest level of fault tolerance. It is the only method offering fault tolerance protection if no more than two physical drives are selected. Drive mirroring creates fault tolerance by storing duplicate data on two drives. There must be an even number of drives. This is the most costly fault tolerance method because it requires 50 percent of the drive capacity to store the redundant data.
  - **Data Guarding**—(RAID 4) assures data reliability while using only a small percent of the logical drive storage capacity. A designated, single physical drive contains parity data. If a drive fails, the controller uses the data on the parity drive and the data on the remaining drives to reconstruct data from the failed drive. This allows the system to continue operating with slightly reduced performance until you replace the drive.
  - **Distributed Data Guarding**—(RAID 5) stores parity data across all the physical drives in the array and allows more simultaneous read operations and higher performance than data guarding (RAID 4). If a drive fails, the controller uses the parity data and the data on the remaining drives to reconstruct data from the failed drive. The system then continues operating with a slightly reduced performance until you replace the failed drive.
  - **Enhanced Mirroring**—(RAID 1E) is used when there are more than two physical disks. Each mirrored stripe is written to a disk and is mirrored to an adjacent disk. If a failure is detected, the data is rebuilt using the data from the mirrored stripes on the other drives.
  - **Unknown**—The Storage Agents cannot determine the fault tolerance of this logical drive. You might need to upgrade your driver software or Storage Agents.
- **Stripe Size**—The size of a logical drive stripe or group of data written to a physical drive in kilobytes. It might be zero in some fault-tolerance modes like **None** and **Mirroring**.
- **Percent Rebuild Complete**—Displays the percent complete of the resynchronization of the data. When the value reaches 100, the rebuilding process is complete. The logical drive continues to operate with slightly reduced performance during the rebuild. This value is only active when the logical drive has a status of **Rebuilding**.

## Physical drives

A list of physical drives that are members of this logical drive. Select one of the listed physical drives to see more information about the drive.

### Spare drives

A list of spare drives that can be used by this logical drive to replace a failed drive. Select one of the listed **spare drives** to see more information about the drive.

## SCSI bus information

Select a SCSI device from the SCSI controller submenu to display more information about the device. The following information might appear depending on the type of device:

- **Parity Errors**—Displays the number of parity errors that occurred on the SCSI bus while the bus was processing commands. The error count is kept from the time the SCSI Hardware Interface Driver was loaded.

  Parity errors might occasionally occur over time. If this number rises dramatically, and you suspect a problem, complete the following steps:

  a. Ensure that the cables are not damaged and that they are intact and properly shielded from possible RFI.

  b. Ensure that all required terminating resistors on all devices on the SCSI bus are present.

  c. Ensure that each device on the SCSI bus has a unique SCSI ID.

- **Phase Errors**—Displays the number of times the SCSI bus entered an invalid operating state while processing commands. The number of errors is counted from the time the SCSI Hardware Interface Driver was loaded.

  If you see any phase errors, the device might have a problem. Phase errors can be caused by a device that is not operating correctly. If the phase errors continue to increase, replace the device.

- **Select Timeouts**—Displays the number of times the controller attempted to start communications with a device and received no response from the device. The number of errors is counted from the time the SCSI Hardware Interface Driver was loaded.

  The number of select timeouts should always be 0. Any other number of timeouts might indicate a problem with the device. The SCSI controller attempts to reset the device, but if the value continues to increase, power cycle the device.

  A large number for this item does not indicate a problem. It shows that the device does not support certain advanced SCSI commands that the device driver issued.

- **Message Rejects**—Displays the number of times the device rejected a command because the device does not support the specific operation. The number of errors is counted since the SCSI Hardware Interface Driver was loaded.

- **Physical Width**—Displays the actual width of the data transfer bus for this device. The following values are valid:
  - **Narrow (8 bits)**—The device supports a narrow 8-bit data transfer bus.
  - **Wide (16 bits)**—The device supports a wide 16-bit data transfer bus.
  - **Unknown**—The Storage Agents are unable to determine the physical data transfer width for this device.

- **Current Width**—Displays the width of the data transfer bus that was negotiated between the controller and the device. If this value is less than the device physical data bus width, the device will not provide maximum performance. Maximum throughput is achieved when both the SCSI controller and device support a wide 16-bit data bus. The following values are valid:
  - **Narrow (8 bits)**—The negotiated data bus transfer width is narrow (8 data bits).
  - **Wide (16 bits)**—The negotiated data bus transfer width is wide (16 data bits).
  - **Unknown**—The Storage Agents are unable to determine the current data transfer width negotiated for this device.

- **Current Speed**—Displays the current negotiated data transfer speed for this device. The following values are valid:
  - **Asynchronous**—The negotiated data transfer speed for this device is asynchronous.
  - **SCSI-1**—The negotiated data transfer speed for this device is 5 million transfers per second.
  - **Fast**—The negotiated data transfer speed for this device is 10 million transfers per second.
  - **Ultra**—The negotiated data transfer speed for this device is 20 million transfers per second.
  - **Ultra2**—The negotiated data transfer speed for this device is 40 million transfers per second.
  - **Ultra3**—The negotiated data transfer speed for this device is 80 million transfers per second.
  - **Ultra320**—The negotiated data transfer speed for this device is 160 million transfers per second.
  - **Unknown**—The agent is unable to determine the current negotiated data transfer speed for this device.

**NOTE:** If the current data transfer width is Narrow (8 bits) then the speed in megabytes per second is equal to the million transfers per second speed. If the current width is Wide (16 bits) then the speed in megabytes per second is twice the million transfers per second speed. For example, if the current speed is Ultra and the width is Wide then the speed would be 40 megabytes per second.

# System Configuration

## Auto Recovery

This section provides Automatic Server Recovery (ASR) configuration information, tells you when the server was last reset, and allows you to modify pager settings. You can modify the Status, ASR Reset Boot Option, Pager Status, Pager Dial String, and Pager Message settings.

The following items display on this window:

### General Information

- **ASR Condition**—This value specifies the overall condition of the ASR. The following values are possible:
  - **Other**—ASR is not supported on server.
  - **OK**—Last reboot was not an ASR reboot.
  - **Degraded**—Last reboot was an ASR reboot but the ASR reset count less than the ASR reset limit.
  - **Failed**—ASR reset count is greater than or equal to the ASR reset limit.
- **Status**—Displays the status of ASR. The following values are possible:
  - **Enabled**—ASR is enabled for this server.
  - **Disabled**—ASR is disabled for this server. To change this status, run the System Configuration Utility or perform a set on this item.
  - **Not Available**—ASR is not available for this server or your driver is not loaded. ASR is available only on operating systems using the ASR software support provided by HP/Compaq.
  - **Unknown**—You may need to upgrade your support software and/or Server Agent(s). The Server Agent cannot determine the status.
- **Last Reset**—Displays how the last server reset was performed. The following values are possible:
  - **ASR**—The last reset was performed by ASR. Check the Critical Error Log to determine what may have caused ASR.
  - **ASR-Cleared**—The last reset was performed by ASR. The degraded condition caused by the ASR reset has been cleared. Degraded ASR conditions can be cleared by selecting the Clear ASR button on the Auto Server Recovery window.
  - **Manual**—The last reset was performed manually.
  - **Unknown**—You may need to upgrade your driver software and/or Server Agents. The Server Agent cannot determine the status of the device.

    If the last reset was an ASR reset, the ASR condition is degraded.
- **Timeout**—Displays how many minutes ASR waits before initiating a recovery process. ASR depends on the software support to routinely notify the ASR hardware that the server is operating properly.

  To change the timeout setting, use the System Configuration Utility. The time you specify for this field should be a prudent period of time before resetting the system and activating the recovery process after a fault occurs. If the timeout period is set too low on a heavily utilized server, the timeout could occur before the software support has time to service the timer.
- **ASR Hardware Version**—Displays the version of the hardware supporting ASR. Use this information for identification purposes.

### Reboot

- **Reset Boot Option**—Displays what the server will boot after an ASR reset occurs. When the recovery process is initiated, ASR resets the server, test all memory, de-allocate any bad memory blocks, and page you (if modem is present in the server and paging is enabled).
- **ASR Reset Limit**—Displays the number of consecutive times that ASR attempts recovery. The Automatic Server Recovery (ASR) feature can restart a server after a critical hardware or software error occurs. ASR attempts the recovery process a limited number of consecutive times. You cannot change this number. If the server continues to experience hardware or software errors and the number of recovery cycles exceeds this limit, the server logs an error to the Critical Error Log, and then continues to boot the Utilities from the hard drive.

Use the ASR Reset Limit feature in conjunction with the ASR Reset Count feature in the same window. The ASR Reset Count feature displays the number of times that ASR has rebooted the server. If the ASR Reset Count is approaching the reset limit, immediately investigate the server for problems by checking the Critical Error Log and running Diagnostics.

- **ASR Reset Count**—Displays how many times the ASR feature has rebooted the server. ASR reboots (or resets) the server a limited number of times. If the ASR Reset Count is incremented, check the Critical Error Log to determine if a serious problem exists.

  If you suspect a software problem, consult your operating system documentation.

  If you suspect a hardware problem, run Diagnostics to determine if a problem exists.

  This count is reset to 0 when the system is reset manually.

### Pager

- **Pager Status**—Displays the status of the pager. If a modem is installed in the server and paging is enabled, ASR can send an alarm to a pager when a critical error occurs.

  The status can be the following:

  - **Enabled**—Paging will occur.
  - **Disabled**—Paging will not occur.
  - **Unknown**—You may need to upgrade your support software or Server Agents or the Server Agent cannot determine the status of this pager.

- **Pager Dial String**—Displays the pager dial string that the server will dial when an alarm occurs. If a modem is installed in the server and paging is enabled, ASR will send an alarm to a pager and deliver a pager message.

- **Pager Message**—Displays the pager message sent when an ASR occurs. The pager message is a numeric value of up to seven digits (characters must be 0 through 9) that identifies the server experiencing the hardware or software failure. There is an additional space for a pound sign (#), which many pagers require for ending a sequence. The numbers are chosen to uniquely identify the server so you know which server experienced a problem.

- **Serial Port**—Displays the communication port that is enabled for use with the ASR feature. For example, this port might be Serial Port 1. ASR uses this port to page the system administrator, and the administrator uses this port when dialing into the device. You can set the Serial Port value.

## Security

The Security section displays each of the following security parameters as either Enabled or Disabled for the selected device:

- **Serial Port Control**—Prevents the transfer of data through the integrated serial interface (COM ports).
- **Parallel Port Control**—Prevents the transfer of data through the integrated parallel port.
- **USB Port Control**—Prevents the transfer of data through the integrated universal serial bus (USB) port.
- **Floppy Disk Control**—Prevents writing to the diskette drives and allows read only access.

## Software Version Information –

This section displays the versions of the system software installed on this machine.

- **Name**—The name of the software installed in the system is displayed.
- **Installed Version**—The version of the software installed in the system is displayed

## System Board

The following information about the system board is displayed. The type of information displayed may vary depending on the device type.

- **Product Name**—Displays the type of device or client PC.
- **System ROM Version**—Identifies the current system ROM version by date. This information may help you track the configuration of the device or client and may be useful for diagnosing service problems. If your system is a ProLiant computer, other information such as the Family Code and Type Code is given.
- **Redundant ROM Version**—Identifies the backup system ROM version by date. This field is not displayed if a Redundant ROM is not available.
- **Remote ROM-based Diagnostics**—Displays the date of the current Remote ROM-based Diagnostics for this device. This field shows NA if Remote ROM-based Diagnostics are not present.
- **Hours in Service**—Displays the number of hours the operating system has been running on this device since the operating system software was installed.

- **Serial Number**—Displays the Physical serial number of the device or client system board. Use this number for identification and registration purposes. N/A appears if you do not have a device or client that supports the asset management feature. Use the System Configuration Utility (or the appropriate utility for your device or client) to enter a system serial number if one does not appear and you have a device or client that supports the asset management feature.
- **Virtual Serial Number**—Displays the Logical serial number of the device or client system board. This field won't be available if you do not have a device that supports this feature.
- **Bus Type**—Identifies the device or client bus type as EISA, EISA/PCI, PCI, PCI-X or PCI Express.
- **Board Rev**—Displays the system board revision number.

## CPUs

The following information about each processor in the system is available in this window. This information may vary depending on device type.

- **Processor**—Lists the type of processor and its speed. For devices, the colored ball indicates the status of each processor.
- **Co-processor**—Displays the type and speed of the coprocessor on the device or client PC, such as 80387 at 33 MHz, or W 3167 at 33 MHz.
- **Slot**—Lists the number of the slot where the processor is installed. Use this information for identification purposes.
- **Slot 0**—Indicates that a CPU or a memory module is connected directly to the system board and not in an expansion board.
- **Socket**—Displays the currently selected processor's socket. Use this information for identification purposes.
- **Cache**—Displays the amount of device or client hardware cache available. For example, Cache L2: 64KB indicates 64 KB of secondary level cache between the processor and system memory.
- **Action**—Indicates what action, if any, should be taken for the currently selected processor. Possible values include No Action Needed, and Replace CPU.
- **Step**—Displays the revision level of the processor.
- **Cores**—Indicates the number of cores present in this processor
- **Threads**—Indicates the number of threads present in this processor
- **Hyper-Thread**—Indicates whether hyper-threading is enabled or disabled. When Hyper-Threading enabled a single processor act as two logical processor and the Operating Systems view it as two processor

📝 **NOTE:** Contact your Compaq/HP authorized re-seller or Hewlett Packard Corporation regarding Pre-Failure Warranty to see if the module is under warranty.

## Memory

This section displays the following information about the Device memory information:

- **Total Memory [KB]** —The total amount of memory available on the device or client PC, such as 8192 KB.
- **Correctable Memory**—Memory errors are corrected by the Error Correcting Code (ECC) memory subsystem when they occur. The Correctable Memory field displays the status of the Correctable Memory as one of the following.
- **Logging**—ECC memory correction is supported and error logging is enabled.
- **Disabled**—ECC memory correction is supported, but errors are not logged for this device.

  When a certain rate of errors is exceeded the health driver automatically disables logging of these errors, and sends an alarm. The errors are corrected, but are no longer logged. Logging is re-enabled when the driver is reloaded or the operating system restarts.
- **Not Supported**—Logging of correctable memory errors is not available for this device. Either the device does not support ECC memory or the driver is not loaded.
- **Unknown**—You may need to upgrade the driver software and/or Server Agents. The Server Agent cannot determine the status of the devices.

## Advanced Memory Protection

This section displays the following information about the Advanced Memory Protection sub-system.

- **Advanced Memory Protection Status**—Displays status of the Advanced Memory Protection sub-system. The following states are supported:

- **Other**—The system does not support Advanced Memory Protection or the Management Agent cannot determine the status.
- **Not Protected**—This system supports Advanced Memory Protection but the feature is disabled.
- **Protected**—The system supports Advanced Memory Protection. The feature is enabled but not engaged.
- **Degraded**—The system was protected, but the Advanced Memory Protection has been engaged; therefore Advanced Memory Protection is no longer available.
- **DIMMECC**—The system is protected via DIMM ECC only.
- **mirrorNoFaults**—The system is protected by Advanced Memory Protection in the mirrored mode.  No DIMM faults have been detected.
- **mirrorWithFaults**—The system is protected by Advanced Memory Protection in the mirrored mode. One or more DIMM faults have been detected.
- **hotSpareNoFaults**—The system is protected by Advanced Memory Protection in the hot spare mode.  No DIMM faults have been detected.
- **hotSpareWithFaults**—The system is protected by Advanced Memory Protection in the hot spare mode.  One or more DIMM faults have been detected.
- **xorNoFaults**—The system is protected by Advanced Memory Protection in the XOR memory mode.  No DIMM faults have been detected.
- **xorWithFaults**—The system is protected by Advanced Memory Protection in the XOR memory mode.  One or more DIMM faults have been detected.
- **advancedEcc**—The system is protected by Advanced Memory Protection in the Advanced ECC mode.
- **Advanced Memory Protection Types Available**—Displays the options available.
- **XOR**—This system is configured for Advanced Memory Protection using the XOR engine.
- **Mirrored memory with dual memory boards**—This system is configured for Mirrored Advanced Memory Protection within a dual memory board configuration. The mirrored memory may be swapped with memory on the same memory board or with memory on the second memory board.
- **Mirrored Memory within a single memory board**—This system is configured for Mirrored Advanced Memory Protection within a single memory board.
- **Advanced ECC**—This system is configured for the Advanced ECC type of  Advanced Memory Protection
- **Mirrored (deprecated)**—This system is configured for Mirrored Advanced Memory Protection
- **Online Spare**—This system is configured for Online Spare Advanced Memory  Protection.
- **Advanced Memory Protection Type Active**—displays the currently active type of Advanced Memory Protection based on the types available. The following connection states are supported:
- **Other**—The Management Agent cannot determine the Advanced Memory Protection fault tolerance. You may need to upgrade your software.
- **None**—This system is not configured for Advanced Memory fault tolerance.
- **Online Spare Memory**— A single spare bank of memory is set-aside at boot time. If enough ECC errors occur, the spare memory is activated and the memory experiencing the errors is disabled.
- **Mirrored Memory**—This system is configured for Mirrored Memory Protection. All memory banks are duplicated in Mirrored Memory, as opposed to only one for Online Spare Memory. If enough ECC errors occur, the spare memory is activated and the memory experiencing the errors is disabled.
- **XOR**—This system is configured for Advanced Memory Protection using the XOR engine.
- **Memory Board**—The slot in which the memory board or cartridge is installed.
    - **Other**—The value is unsupported or could not be determined.
    - **Present**—The board or cartridge has memory and is currently online.
    - **Absent**—The board or cartridge is offline.
- **Board Status**—This provides the current status of the Advanced Memory Protection memory board or cartridge. The following status values are supported:
    - **Other**—The condition of this memory board or cartridge could not be determined.
    - **OK**—The memory board or cartridge is operating normally.
    - **Degraded**—The memory board or cartridge is in an error state. Check for correct memory installation and that the board has been inserted properly.
- **Total Board Memory**—This value specifies the size of memory for this board or cartridge, including memory seen by the OS and the memory used for spare, mirrored, or XOR configurations.
- **Memory in Use**—This value specifies the size of memory for this board or cartridge as seen by the OS.

- **Advanced Memory Protection Condition**—displays the current condition of the Advanced Memory Protection subsystem. The following states are supported:
  - **Other**—The system does not support fault tolerant memory or the Management Agent cannot determine the state.
  - **OK**—This system is operating normally.
  - **Degraded**— The Advanced Memory Protection sub-system has been engaged. Schedule server down time to replace the deactivated memory.

## ROM Microcode Patches

This section displays the following information about ROM Microcode Patches:

- **Patch ID**—Displays the number of a particular microcode patch.
- **Date**—Displays the date of a patch's manufacture.
- **Family**—Specifies the valid family, model, and step that applies to a patch.
- **Model**—Displays the model number of a patch.
- **Step**—Displays the revision level of a patch.

## General I/O Devices

This section displays information about the following I/O devices:

- **Keyboard Type**—Describes the keyboard attached to your monitored system. For example, 101-key Enhanced Keyboard.
- **Video Type**—Describes the type of video in use with the monitored system. For example, EGA or VGA may appear here.
- **Auxiliary Input** —Indicates whether the auxiliary input (pointing device or mouse port) is enabled or disabled. If you have an EISA-based machine, use the System Configuration Utility to change this value. If you have an ISA-based machine, use SETUP to change this value.
- **Diskette Drives**—This section lists and describes the device diskette drives.
- **Serial and Parallel Ports**—This section displays the serial ports and the parallel ports that have been enabled for this unit, along with their corresponding I/O addresses. The industry-standard addresses for parallel ports are as follows:
  - Primary Port set to 378h
  - Secondary Port set to 3BCh
  - The industry-standard addresses for serial ports are as follows:
  - COM1 set to 3F8h
  - COM2 set to 2F8h
  - These addresses are sometimes changed due to conflicts with another device. Communication ports that have been disabled do not show up in this window.
- **Universal Serial Bus Port**—This section displays the Universal Serial Bus (USB) ports that have been enabled for this unit.
- **Memory Modules**—This section lists detailed information about the memory boards and modules installed in the system. The following items may be displayed:
  - Socket Number—displays the socket number for the memory module.
  - Type—displays the following values depending on the type of memory module selected.
  - Not installed
  - Board—The memory module is permanently mounted (not modular) on a system board or memory expansion board.
  - Single width module
  - Double width module
  - SIMM (Single Inline Memory Module)
  - PCMCIA (Personal Computer Memory Card International Association technology memory module)
  - Compaq/HP specific memory module
  - DIMM (Dual Inline Memory Module)
  - Size—Displays the size of the memory module.
  - Speed—Displays the speed of the memory module.
  - Technology—Displays the possible values for the memory module technology, including:

- FPM (Fast-Page Mode)
- EDO (Extended Data Out)
- BEDO (Burst Extended Data Out)
- Synch DRAM (Synchronous DRAM)
- Unknown

## System Resources

This section lists the resources in use by the device or client workstation in the following order:

- **IRQ Numbers**—The Interrupt Request number displays, followed by the slot number of the board that is using this interrupt.
- **Port Address**—The port address range displays, followed by the slot number of the board that is using this I/O port range.
- **DMA Channels**—The DMA channel displays, followed by the slot number of the board that is using this channel.
- **Memory**—The memory range displays, followed by the slot number of the board that is using this memory.

📝 **NOTE:** A slot number of "system" in the device, or "embedded" in the client workstation, refers to slot zero.

## System Summery

HP System Insight Manager automatically collects configuration information for all devices in the Responsible Device List. This information is used by filtering subsystems, which allow you to filter your devices on such things as processor type or network operating system. The type of information collected during Configuration Data Collection is useful for asset management.

The following System Information is displayed. Information varies depending on the device type:

- General Information
- Product name displays the type of device or client PC.
- Operating system displays the type of operating system installed on the device.
- Server Role displays a free form text field intended for briefly describing the system's function if available.
- SMBIOS Version displays the version of SMBIOS on the device if applicable and available.
- Machine ID (System Board) displays the identification number of the machine.
- Type of expansion bus identifies the device or client bus type as EISA, EISA/PCI, PCI ,PCI-X or PCI-Express.
- Description Information
- System Name displays the name of the device.
- Description displays a description of the device, including hardware and software.
- Network Management Up Time displays the amount of time since the network management portion of the system was last reinitialized.
- Contact Information displays the name of the person to contact about this device.
- Location displays the physical location of the device.
- IP Address displays the network location of the device.
- Power Management
- This section displays the state of power management on the system (enabled or disabled).
- Asset Control Information
- Serial Number displays physical the serial number of the device or client system board. Use this for identification and registration purposes. N/A appears if you do not have a device or client that supports the asset management feature. Use the System Configuration Utility (or the appropriate utility for your device or client) to enter a system serial number if one does not appear and you have a device or client that supports the asset management feature.
- Serial Number (Logical) displays the Logical serial number of the device or client system board. This field won't be available if device does not supports this feature.
- Product ID displays a unique type of Product and is used for reorder purposes.
- Asset Tag displays a changeable asset control number and is used for identification purposes.
- Board Rev displays the system board revision number.
- Monitor Model displays the monitor model. Use this item for identification purposes.

- Monitor Serial Number displays the serial number for the monitor. Use this number for identification purposes.
- Monitor Manufacture Date displays the monitor's date of manufacture date

## Enclosure Information

- If your system is a blade server based system, the navigation frame displays the Enclosure Information link under the Configuration section. The middle Navigation frame is the Enclosure Information window and it displays the detailed information about the enclosure. By clicking each of the links, the user van display the enclosure's detailed information in the data frame.
- Rack Asset
- Contains information about the rack.
- Rack Asset Information
- Rack Name
- Rack Identifier
- Serial Number
- Power Enclosure
- Indicates the condition of the power sub-system for the power chassis, along with the redundancy state and load balance state.
- General Information
- Information about Power Enclosure have been listed below.
- Enclosure Model
- Asset Tag
- Part Number
- Spare Pat Number
- Serial Number
- Firmware Revision
- Previous Enclosure Name
- Next Enclosure Name
- Height \ Width \ Depth
- Unit Identification LED
- Previous Enclosure Serial Number
- Next Enclosure Serial Number
- Address
- Redundant
- Load State
- Input Power Type
- Maximum Power
- Enclosure Power Supplies
- Condition
- Power Supply
- Serial Number
- Part Number
- Spare Part Number
- Firmware Revision
- Max Power Output
- Current Power Output
- Intake Temprerature
- Exhaust Temprature
- Status
- Server Enclosure
- Indicates the condition of the power sub-system for the power chassis, along with the redundancy state and load balance state.
- General Information
- Information about Power Enclosure have been listed below.

- Enclosure Model
- Asset Tag
- Part Number
- Spare Pat Number
- Serial Number
- Firmware Revision
- Previous Enclosure Name
- Next Enclosure Name
- Height \ Width \ Depth
- Unit Identification LED
- Previous Enclosure Serial Number
- Next Enclosure Serial Number
- Address
- Maximum Blade Number
- Enclosure Blade Information
- Name
- Part Number
- Spare Part Number
- Position (Slot Number)
- Height \ Width \ Depth
- Number of Bays Occupied
- Enclosure Fuses
- Condition
- Fuse
- Location
- Present
- Enclosure Network Connector
- Name
- Model
- Serial Number
- Part Number
- Spare Part Number
- Firmware Revision
- Type
- Location
- Present

📝 **NOTE:** The iLO driver and the Rack Management Dispatch Service must be installed for the Rack Information sub-agent to communicate with the rack infrastructure.

Following information is listed on the C-Class Enclosure Information Screen:

- **Onboard Administrator Link**—The web link to the enclosure managers web based management information for the enclosure
- **Onboard Administrator IP Address**—The IP address of the rack enclosure manager
- **Enclosure Serial Number**—The serial number of the enclosure
- **Enclosure Product ID**—The Enclsoure product identifier. The string will be empty if it could not be determined
- **Enclosure FirmWare Revision**—The Firmware revision of the Enclosure Manager/Onboard Administrator. The string will be empty if it could not be determined.

## Information availability to a WMI consumer

For Windows 2000, the formatted OS performance data is available by registering a Windows WMI provider that supplies the formatted final OS performance data. The data is populated in WMI under the specific classes as follows:

Namespace: `root\default`

Object Class: `CPQ_System_Performance`

Subclasses:

- CPQ_System
  - ContextSwitchRate
  - CpqQueueLength
  - Processes
  - RegistryUsage
  - SystemUpTime
  - TotalThreads
- CPQ_Server
  - AccessPermissionErrors
  - ContextBlockQueueRate
  - GrantedAccessErrors
  - LogonErrors
  - ServerSessions
  - SessionsErroredOut
  - TotalByteRate
- CPQ_Processor
  - CpuTimePercent
  - CpuUserTimePercent
  - InterruptRate
  - PercentDPCTime
  - PercentInterruptTime
  - PrivelegedCpuTimePercent
  - Processor
- CPQ_Memory
  - AvailableKBytes
  - CacheBytes
  - CacheFaultRate
  - PageFaultRate
  - PageInputRate
  - PageOutputRate
  - PageRate
  - PageReadsPersec
  - PageWritesPersec
  - PoolNonpagedBytes
- CPQ_PagingFile
  - PageFileUsagePercent
  - PagingFile
- CPQ_Cache
  - CopyReadHitsPercent
  - CopyReadRate
- CPQ_PhysicalDisk
  - CurrentDiskQueueLength
  - DiskBytesPersec
  - DiskQueueLength
  - DiskReadBytesPersec
  - DiskReadsPersec
  - DiskTimePercent
  - DiskTransfersPersec

- DiskWriteBytesPersec
- DiskWritesPersec
- PhysicalDisk
- CPQ_LogicalDisk
  - DiskQueueLength
  - DiskTimePercent
  - FreeMegabytes
  - FreeSpacePercent
  - LogicalDisk
- CPQ_NetworkInterface
  - BytesReceivedPersec
  - BytesSentPersec
  - CurrentBandwidth
  - NetworkInterface
  - OutputQueueLength
  - PacketOutboundErrs
  - PacketRate
  - PacketReceiveErrs
  - PacketsReceivedPersec
  - PacketsSentPersec
  - TotalByteRate
- CPQ_Tcp (CPQ_Tcpv4 for Windows Server 2003)
  - ConnectionFailures
  - ConnectionsActive
  - ConnectionsEstablished
  - SegmentsRate
  - SegmentsRetransmitRate
- CPQ_Process
  - CpuTimePercent
  - PageFaultRate
  - PageFileBytes
  - PrivateBytes
  - PrivelegedTimePercent
  - Process
  - ThreadCount
  - WorkingSet

Under Windows Server 2003, the formatted data is also available under the WMI CIMV2 namespace as:

- Namespace: root\CIMv2
- Subclasses of CIM_StatisticalInformation\Win32_Perf\Win32_PerfFormattedData

## Critical Error Log

The Critical Error Log records non-correctable memory errors, as well as catastrophic hardware and software errors that cause a system to fail. This information provides information to quickly identify and correct the problem, minimizing downtime.

This section displays a description of critical errors. The date and time of each error is followed by a brief description of the error. The time shown is rounded to the nearest hour.

If critical errors are marked with an exclamation point (!), indicating corrective action is required, the log condition is degraded. To eliminate the exclamation mark and indicate that an entry has been corrected, select the entries to clear, and then click the **Correct Marked Entries** button or run System Diagnostics on the device. An asterisk (*) indicates the log entry to which the Last Failure Message applies.

📝 **IMPORTANT:** To mark entries as corrected, the agents must have sets enabled and the SNMP Community string must be correct.

The following list describes errors that might be logged. If any of these errors occur, run System Diagnostics on the system or see the software documentation.

- **Abnormal Program Termination**—A device has detected a fatal software error resulting in a device failure.
- **ASR Base Memory Parity Error**—The system detected a data error in base memory following a reset because an ASR timeout.
- **ASR Extended Memory Parity Error**—The system detected a data error in extended memory following a reset because an ASR timeout.
- **ASR Memory Parity Error**—The system ROM was unable to allocate enough memory to create a stack. It was unable to put a message on the screen or continue booting the server.
- **ASR Reset Limit Reached**—The maximum number of system resets has been reached. The System Configuration utilities are loaded.
- **ASR Reset Occurred**—No error data is logged.
- **ASR Test Event**—An ASR Test Event was generated by the user through the system utilities. No action is required because the event was user-generated to test the ASR configuration.
- **ASR Timeout NMI**—The server has generated an ASR NMI because the ASR timer has not been refreshed. This generally indicates a driver has not relinquished control of the processor causing a server failure. The resulting ASR NMI was generated to log this event.
- **CPU Internal Corrected Error Threshold Exceeded**—The system has detected that a processor has exceeded the threshold for the number of internal ECC cache errors.
- **CPU Processor Power Module Failed**—The system has detected that a processor's power module has failed.
- **Critical Temperature**—The system's critical temperature has been exceeded and auto shutdown has been initiated.
- **Error Detected On Bootup**—The system detected an error during the Power-On Self-Test (POST).
- **Exception**—The processor has detected a critical exception resulting in a device failure.
- **Fan Failure**—The system or processor fan failed.
- **NMI-Processor Local Error**—The processor experienced a fatal error resulting in a device failure.
- **NMI-Expansion Board Error**—A board on the expansion bus indicated an error condition causing a device failure.
- **NMI-Expansion Bus Arbitration Error**—Memory refresh cycles were delayed, potentially leading to data loss. The error results in a system failure.
- **NMI-Expansion Bus Master Time-out**—A bus master expansion board in the indicated slot did not release the bus after its maximum time resulting in a device failure.
- **NMI-Expansion Bus Slave Time-out**—A board on the expansion bus delayed a bus cycle beyond the maximum time resulting in a device failure.
- **NMI-Failsafe Timer Expiration**—The software was unable to reset the system failsafe timer, resulting in a system failure.
- **NMI-Processor Address Error 1**—A processor internal address parity checking error occurred, resulting in a device failure.
- **NMI-Processor Address Error 2**—The processor detected an address parity error during an inquire cycle.
- **NMI-Processor Cache Parity Error**—A data error occurred within the processor cache, resulting in a system failure.
- **NMI-Processor Internal Error 1**—A processor internal parity error occurred, resulting in a device failure.
- **NMI-Processor Internal Error 2**—The processor detected an internal parity error or a functional redundancy error.
- **NMI-Processor Parity Error**—The processor detected a data error resulting in a device failure.
- **NMI-Software Generated Interrupt**—Software indicated a system error resulting in a system failure.
- **NMI-System Concurrency Error**—A potential error condition was detected within the Data Flow Manager, resulting in a system failure.
- **NMI-Uncorrectable Memory Error**—The device experienced an uncorrectable memory parity error resulting in a device failure.
- **NMI-Unknown Error Type**—The device driver does not recognize this NMI. The health driver might need to be updated.
- **Processor Failure**—The processor failed during the POST.

- **Server Manager Failure**—An error occurred in the server interface with the Server Manager.
- **UPS A/C Line Failure/Shutdown or Battery Low**—The device has initiated a UPS or operating system shutdown, or the battery is almost depleted after an AC line failure.

The Last Failure Message on this window displays the last failure message associated with a critical error.

## Correctable errors

This alarm indicates that a block of memory has failed or is failing and might need to be replaced. This condition is generally non-critical because the memory controller can correct the problem. However, this type of error indicates that a memory component is failing or has failed in the system issuing the alarm. The system continues to correct any errors it can.

Memory errors are corrected by the ECC memory subsystem when they occur. If these errors increase, correct the problems as soon as possible. Further degradation of the memory components might occur, and then errors can no longer be correctable.

## Power-On Messages

The Power-On Messages section displays the Power-On messages logged when the device was turned on. For a listing of possible Power-On error messages and their meanings, see the device documentation. Click the **Clear Power-On Message** button to clear the Power-On message log. This button is only available if there are messages to clear.

## Integrated Management Log

The Integrated Management Log records system events, critical errors, power-on message errors, and memory errors. The log also records catastrophic hardware and software errors that typically cause a system to fail. This information helps to quickly identify and correct the problem and minimize downtime.

Each event log entry has a status to identify the severity of the event:

- **Informational**—General information about a system event.
- **Repaired**—An entry has been repaired. Users must mark entries as repaired.
- **Caution**—A non-fatal error condition has occurred.
- **Critical**—A component of the system has failed.

If any events in the log have a condition of Caution, the overall log condition is marked as degraded. If Critical events exist in the log, the overall log condition is marked as failed.

To clear a degraded or failed event log, repair the condition that caused a log entry to be generated, and then mark the log entry as repaired. Perform the following steps:

1. Highlight the log entries in the Integrated Management Log.
2. Click the **Mark Repaired** button. This button is located at the bottom of the Integrated Management Log section of the Web browser.

**IMPORTANT:** To be able to mark log entries as corrected, agents must have sets enabled and the SNMP Community string must be correct.

**IMPORTANT:** The Monitor and Control community strings for the device is required. The HP Insight Management Agents and HP Systems Insight Manager uses these community strings to communicate with the OS SNMP service. If a Control community string is not created, it is not possible to perform certain operations, such as clearing the Integrated Management Log or changing agent configuration settings.

The Description column gives a brief description of the error or event. The Update Time column contains the last time this log was updated. The Status column contains the status of the log entry.

## Remote-Insight Board event log

The Event Log section displays the list of events stored in the Remote-Insight Board event log. A user with the appropriate authority can clear these events. Each event includes the following information:

- **Index**—Displays a numeric index for each event.
- **Time of Event**—Displays the time the event occurred.
- **Description**—Displays a text description of the event.

# 3 Subsystem specific to a NetWare operating system

## Operating system overview

HP now provides operating system management for NetWare environments. The NetWare operating system information on the server being monitored displays when running NetWare 4.x with NetWare Management Agent from Novell or NetWare 5.0,. The information that is displayed includes file system information, user information, connection information, NetWare Loaded Modules (NLM) information, server parameters, partition information, and adapter information. By displaying the information as a subsystem in the Insight Management Agents by means of a browser, both the hardware and operating system can be monitored from one application.

**NOTE:** To ensure security, some NetWare Operating System information is accessible only when the user is logged in as an administrator or an operator. If you do not have administrator or operator access, Information Unavailable appears on certain pages and tables.

## Summary page

The Summary page describes basic information about the selected NetWare server. The following information is listed:

- **NetWare Server Name**—The physical name of this NetWare server.
- **Internal Net Number**—The internal IPX network number of this server.
- **Serial Number**—The serial number of the NetWare Operating System instance running on this server.
- **Operating System**—The version number of the NetWare Operating System running on this server.
- **Release Date**—The release date of the NetWare Operating System running on this server.
- **Time Zone**—The time zone in which this server resides. The string is in the same format as in the NetWare SET TIMEZONE command.
- **Login State**—The current login state of this server.

**NOTE:** The login state of a server can be not applicable, enabled, or disabled.

- **Language**—The national language in use on this server. The language can be one of the following:

Table 3-1  Available languages

| Canadian French | Finnish | Portuguese |
| --- | --- | --- |
| Chinese | French | Russian |
| Danish | German | Spanish |
| Dutch | Italian | Swedish |
| English | Japanese | Other |

- **Directory Services Name**—The Directory Services full-distinguished name of this NetWare server. Only the operator and administrator have the right to retrieve this information.
- **Bindery Context**—The container objects where the bindery services contexts is set. Only the operator and administrator have the right to retrieve this information.
- **Directory Tree**—The name of the NetWare directory services tree containing this server. Only the operator and administrator have the right to retrieve this information.
- **System Time**—The date and time kept by this server.
- **Up Time**—The time (in hundredths of a second) since this server was last restarted.
- **User Count**—The number of entries in the User Account Table. Only the operator and administrator have the right to retrieve this information.
- **Logged-In Users**—The number of licensed connections (logins) in this file server. Only the operator and administrator have the right to retrieve this information.

# File System page

The File System page provides the file system information for the server. The page is divided into the following three sections:

- File System
- File Volume
- Open Files

## File System

The File System section displays the following information:

- **Reads (Kbytes)**—The total number of Kilobytes read by the file system. This value provides a measure of server activity.
- **Writes (Kbytes)**—The total number of Kilobytes written by the file system. This value provides a measure of server activity.
- **Maximum Open Files**—The maximum number of open files allowed in the file system.
- **Open Files**—The current number of open files in the file system.
- **Maximum Record Locks**—The maximum number of record locks allowed in the file system.
- **Record Locks**—The current number of record locks in the file system.
- **Maximum Directory Tree Depth**—The number of levels of subdirectories NetWare supports.

## File Volumes

The File Volumes table lists all of the NetWare volumes, both mounted and not mounted.

- **ID**—A unique value that identifies each NetWare volume on the server. The value for each volume must remain constant from one re-initialization of the agent to the next re-initialization.
- **Volume Name**—The name of the physical volume, which might differ from the Directory Services (DS) name.
- **Volume Size (Kbytes)**—The size of the physical volume in Kilobytes.
- **Free Space (Kbytes)**—The free space on the physical volume in Kilobytes. As this number approaches zero, the volume is running out of space for new or expanding files.
- **Block Size (bytes)**—The block size on the volume in bytes.
- **Segment Count**—The number of segments making up this volume.
- **Mount Status**—The mount state of the volume, which can be 1 mounted or 2 dismounted.

> **NOTE:** If the volume is not mounted, all the other values in the File Volumes table, except Volume Name, are valid.

- **DS Name**—The full Directory Services distinguished name for the volume, or the zero-length string if the distinguished name is not applicable.

## Open Files

The Open Files table lists all of the open files on the server. If a file is opened by more than one connection, multiple entries for the same file appear in the table. Only the operator and administrator have the right to retrieve this information. The information in this table is sorted by File Name value by default. The Open Files table lists the following values:

- **Connection**—The number of the connection that opened the file.
- **File Name (sortable)**—The name of the open file including the directory path.
- **Login Name (sortable)**—The name of the user (if any) who opened the file. If the file was opened by the system or by an NLM, the Login Name is a zero-length string.
- **Volume Name (sortable)**—The name of the NetWare physical volume containing the open file.

# User Information page

The User Information page lists all user accounts in this file server. Users in the table might or might not be logged in at the time the page is viewed. The page is divided into two sections: General Information and User Information.

# General information

The General Information section displays the following information:

- **User Count**—The number of entries in the User Account Table.
- **Logged-In Users**—The number of licensed connections (logins) in this file server.
- **Maximum Logins**—The maximum number of licensed connections (logins) supported by this file server. The value is zero if the maximum number is unlimited.
- **Connection Count**—The current number of entries in the Connection Table. The current number of connections to this file server includes connection 0 (zero), which is the system connection.
- **Maximum Connections**—The maximum number of connections supported by this file server. The value is zero if the maximum number is unlimited.

# User information

📝 **NOTE:** Only the operator and administrator have the right to retrieve user information.

The User Information table is sorted by the Name value by default. The table displays the following information for each user:

- **Name (sortable)**—The user login name (the Directory Services full distinguished name where appropriate)
- **Disk Usage (Kbytes) (sortable)**—The amount of disk space, in Kilobytes, the user is occupying across all volumes on this server
- **Account (sortable)**—The status of the user account, which can be either valid or expired
- **Password (sortable)**—The status of the user password, which can be either valid or expired
- **Full Name (sortable)**—The user full name
- **Last Login Name (sortable)**—The last user to log in to this server

# Connection page

📝 **NOTE:** Only the operator and administrator have the right to retrieve this connection information.

The Connection page displays NetWare connection information and lists all connections used, including those used by Workstations, NLMs, and Attachments. The information on this page is sorted by the Name value by default. The Connection page displays the following information for each connection:

- **Number**—The connection number. Connection 0 (zero) is used by the system.
- **Name (sortable)**—The login name (the Directory Services full distinguished name where appropriate).
- **Status (sortable)**—A value that represents the login status of the user. A user can have multiple statuses at the same time. A status can be one of the following:

Table 3-2  Available status conditions

| Not logged in | Audited |
|---|---|
| Logged in | Authenticated temporary |
| Need security change | Audit connection recorded |
| MacStation | DS audit connection recorded |
| Connection abort | Logout in progress |

- **Address (sortable)**—The transport address and domain of the connection.
- **Connection Time (sortable)**—The date and time the connection was established.

# Loaded NLMs page

The Loaded NLMs page is sorted by loaded order by default. The page displays the following information for each module:

- **Name (sortable)**—The name of the NLM that is currently loaded on the server.

- **Memory (bytes) (sortable)**—The total memory, in bytes, used by the NLM. This value is a composite of Short Term Memory, Semi-Permanent Memory, and Non-movable Cache Memory allocated by the NLM, plus the sizes of the code and data sections of this instance of an NLM.
- **Description (sortable)**—A brief description of the NLM.
- **Version (sortable)**—The major and minor version numbers of the NLM.

# Server Parameter page

The Server Parameter page includes a table of the NetWare set parameters. This table emulates the NetWare SET command.

**NOTE:** Only the operator and administrator have the right to retrieve this server parameter information.

In the middle frame, server parameters are categorized by their features. When a category link is clicked from the middle frame, only the server parameters that fit into this category show up in the frame on the right. The server parameter table in the frame on the right is sorted by the Name value by default and the table displays the following information:

- **Name**—The name of the settable parameter.
- **Value**—The current value of the parameter.
- **Range**—The range of value can be set on the parameter. An Out of Range warning is given if the administrator or operator tries to do an invalid set.
- **Description**—A brief description of the NetWare set parameter.

The Set Parameter table enables the administrator and operator to remotely change the server operating system configuration and parameter settings through the Web browser. The modifiable variable can be categorized as follows:

- **String**—The maximum length for the string field is the upper-limit settable length of the string. If the length of the set string exceeds the defined maximum length, an Out of Range warning appears and the set is aborted.
- **Boolean**—The OFF and ON radio buttons are used to set the Boolean type parameter. Click the radio button to select either **OFF** or **ON**, and then click **SET**. The set is done.
- **Ticks**—For the convenience of the administrator or operator, the Ticks-type parameter is calculated and displayed as seconds. So when do a set, modify the amount of the seconds in the text field, and click **SET**. If the seconds set is not in the range of the predefined seconds, and an Out of Range warning appears and the set is aborted.
- **TimeOffset**—In the format of +/- XX:XX:XX (hour:minute:second). To do a set, modify the value in the predefined format in the text field, and click **SET**.
- **BlockShift**—An integer typeset. Modify the value in the text field, and click **SET**.
- **Trigger**—An integer typeset. Modify the value in the text field, and click **SET**.

In NetWare 4.x, all the sets done through command line or Monitor utility take effect immediately, but the sets are lost when the server is rebooted. The Web Agent overcomes this drawback by writing the SET command in Autoexec.ncf when a set is committed through the Web Agent browser so it is a permanent set. In NetWare 5.x, the SET command is not added in the Autoexec.ncf, because the operating system can remember the set even after the reboot.

## SET exceptions

In both NetWare4.x and NetWare 5.x, when the administrator or operator tries to do a SET on a variable that is only settable through the Startup.ncf file, a `SET XXXXX=XXXX` line is added in the `Startup.ncf` file. Although, the SET does not take effect until the remote server is restarted, when SET is clicked, a warning message appears.

In NetWare 5.x, when trying to do a lower-than-current-value SET on alert message nodes, an HTTP post error warning appears. Be alert, because the operating system is denying this SET. If this SET is done through the command line or Monitor utility, the same denial occurs.

# Physical Partition page

The Physical Partition page displays a table of physical partitions for long-term storage devices contained by the host. The table on the Physical Partition page is sorted by the Type value by default.

- **Type (sortable)**—The type of this physical partition. The types listed can be:
  - NetWare
  - DOS

- InwDos
- Other
- **Description (sortable)**—A brief description of this partition.
- **Size (sortable)**—The size (in Kilobytes) of this physical partition.

# Adapter Information page

The Adapter Information page displays general information for each adapter board in the host. The Adapter table is sorted by the Description value by default.

**Description**—A description of the hardware information for the adapter. The description usually includes manufacturer, model, and version information. For LAN adapters, the short board name and the burnt-in MAC address of the boards are listed.

# 4 CR3500 RAID Array SCSI controller

## Mass storage RAID Array

This section displays RAID array information. Five banners appear in this section.

### RAID array status

- **Status**—Displays the status of the RAID array. The following conditions are valid:
  - **Good**—The RAID array is fully operational.
  - **Reduced**—The RAID array is operating in a degraded or reduced state. One or more of the physical drives that make up the RAID array are either missing or failed. However, the RAID array can continue to operate without data loss.
  - **Failed**—The RAID array is not operational.
  - **Reconstructing**—The RAID array is regenerating the data from a failed physical drive onto a replacement drive that is part of the RAID array. All user data remains available during the reconstruction process, but some performance reduction might occur when a request requires access to the device being reconstructed.
  - **Initialization**—The controller is writing its file structure onto the member devices of a RAID array.
- **RAID Level**—Displays the RAID level and a brief description of the selected RAID array.

### Drive information

**Capacity**—Displays the total capacity of the RAID array in megabytes

### Physical drives

**Physical Drive Channel**—Displays the channel number, also referred to as the "port"

**Physical Drive SCSI ID**—Displays the SCSI ID number

### Logical drives

**Logical Drives**—Lists the logical drives

### Spare drives

**Controller**—Displays the controller name.

**Spare Status**—Displays the status of the online spare drive. The following conditions are valid:

- **Hot Spare**—The drive attached to this channel is kept spinning whenever the controller is powered up. It is to be automatically brought online to replace a failed drive.
- **Warm Spare**—The drive attached to this channel is not spun up until a disk in the array fails. It is to be automatically brought online to replace a failed drive.
- **Adding Spare**—The drive is in the process of becoming a spare drive.

## Mass Storage Physical

This section displays physical drives attached to the CR3500 RAID controller. Three banners appear in this section.

### Physical Drive status

The following conditions are valid:

- **On Line**—The drive attached to this channel is a fully-functional member of this RAID set.
- **Off Line**—The drive attached to this channel is not a member of the RAID set.
- **Hot Spare**—The drive attached to this channel is kept spinning whenever the controller is powered up. It is to be automatically brought online to replace a failed drive.
- **Warm Spare**—The drive attached to this channel is not spun up until a disk in the array fails. It is to be automatically brought online to replace a failed drive.
- **Creating**—The drive is currently being created as part of a RAID set.
- **Rebuilding**—The drive is currently being rebuilt.

- **Formatting**—The drive is currently being formatted.
- **Action**—Provides a brief description of an action you can take depending on the physical drive condition

## Drive information

- **Capacity**—Displays the total capacity of the selected drive in megabytes
- **Firmware Version**—Displays the firmware revision of the selected drive
- **Drive Owner**—Lists a descriptive name for the drive owner
- **Model**—Displays the model number of the selected drive
- **Vendor**—Displays the vendor of the selected drive

## RAID Arrays

**RAID Arrays**—Lists the RAID arrays by channel number and SCSI ID

# Mass Storage controller

This section displays Array Controller information.

## Clustered RAID controller

- **Controller Status**—Displays the current controller status. The following conditions are valid:
  - **OK**—All controller functions are operating normally.
  - **Degraded**—The controller is operating in a degraded or reduced state.
  - **Failed**—The controller is inoperable.
- **Current Role**—Displays if the controller is in simplex or duplex role.
- **Firmware Version**—Displays the current software revision.
- **Serial Number**—Displays the controller serial number.
- **Drive Ownership**—Lists a descriptive name for the drive owner.
- **Rebuild Rate**—Displays the rebuild rate. The rebuild rate ranges from 1 to 100. The controller rebuilds while at the same time it handles I/O activity. A rate below 50 emphasizes I/O response over the RAID rebuild. A rate above 50 puts a higher priority on the RAID rebuild at the expense of I/O activity.
- **Create Rate**—Displays the create rate. The create rate ranges from 1 to 100. The controller creates RAID sets while, at the same time, handles I/O activity. A rate below 50 emphasizes I/O response over the RAID set creation. A rate above 50 puts a higher priority on the RAID set creation at the expense of I/O activity.
- **Cache Size**—Displays the cache size in megabytes.
- **DIMM A Size**—Displays the Dual Inline Memory Module A size in megabytes.
- **DIMM B Size**—Displays the Dual Inline Memory Module B size in megabytes .

# Mass Storage Summary

## CR3500 Shared Storage system

This section displays degraded or failed devices in the CR3500 Shared Storage system.

The following is a list of devices in CR3500 Shared Storage system:

- Clustered RAID Controller
- RAID Array
- Physical Drive
- Spare Drive
- Environment Monitoring Unit

# Environment Monitoring Unit

This section displays the Environment Monitoring Unit information.

- **Primary enclosure temperature status**—Displays the current primary enclosure temperature status. The following conditions are valid:
  - **OK**—The primary enclosure temperature is within normal parameters.

- **Critical**—The controller temperature sensor has detected a critical temperature condition in the primary enclosure.
  - **Non-critical**—The controller temperature sensor has detected an abnormal temperature condition in the primary enclosure.
  - **Unknown**—The enclosure temperature information is unavailable.
- **Primary enclosure temperature**—Displays the current primary enclosure temperature in degrees Celsius.
- **Primary enclosure fan status**—Displays the current primary enclosure fan status. The following conditions are valid:
  - **OK**—The fan status is normal.
  - **Critical**—The fan has failed.
  - **Unknown**—The enclosure fan status information is unavailable.
- **Primary power supply status**—Displays the current primary power supply status. The following conditions are valid:
  - **OK**—The power supply status is normal.
  - **Critical**—The power supply is installed and marked as failed.
  - **Not Installed**—One of the redundant power supplies has been removed.
  - **Unknown**—The power supply status information is unavailable.

# External Expansion Cabinet

This section displays the External Expansion Cabinet information. The following conditions are valid:

- **Power Supply Status**—Displays the current status. The following conditions are valid:
  - **OK**—All power supply parameters are normal.
  - **Non-Critical**—The redundant power supply is reporting a fault that is not critical to operation.
  - **Not Installed**—One of the redundant power supplies has been removed.
  - **Unknown**—The power supply information is unavailable.
- Fan Status displays the current fan status. The following conditions are valid:
  - **OK**—All fans are operating normally.
  - **Critical**—A fan has failed.
  - **Non-Critical**—A fan is in a degraded condition.
  - **Not Installed**—The fan has been removed.
  - **Unknown**—The fan status information unavailable.
- **Temperature Status**—Displays the current temperature status. The following conditions are valid:
  - **OK**—All temperature sensors are reporting normal.
  - **Critical**—Temperatures have reached the critical level, and failure might be imminent.
  - **Non-Critical**—The temperature is outside of the normal range, but has not reached the critical level.
  - **Not Installed**—The temperature sensors cannot be read.
  - **Unknown**—The temperature status information is unavailable.

# 5 Where to go for additional help

In addition to this guide, the following information sources are available:

- *HP Insight Management Agents 7.30 Installation Guide*
- HP Insight Manager software

## Telephone numbers

For the name of the nearest HP authorized reseller, see the HP website **http://www.hp.com/service_locator**.

For HP technical support:

- In North America:
  - Call 1-800-HP-INVENT (1-800-474-6836). This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.
  - If you have purchased a Care Pack (service upgrade), call 1-800-633-3600. For more information about Care Packs, see the HP website **http://www.hp.com**.

Outside North America, call the nearest HP Technical Support Phone Center. For telephone numbers for worldwide Technical Support Centers, see the HP website **http://www.hp.com**.

# Appendix A Troubleshooting

## Insight Management Agents for Servers issues

### Inability to perform remote reboot on a server from the Management Console

1. Load CPQAGIN.
2. Verify that Remote Reboot is enabled.
3. Verify that Sets are enabled.

Global unique identifiers are the same for all devices when using disk imaging software on servers

**Solution 1:** If the disk image has not been taken, perform the following steps after installing the Insight Management Agents on the source machine and capture the image before restarting the Insight Management Agents.

1. Uninstall all Insight Management Agents from one of the devices.
2. Use the disk imaging software to copy the configuration from the device without the Insight Management Agents installed.
3. Use the disk image to copy to the target devices.
4. Reinstall the Insight Management Agents on all the devices.

**Solution 2:** If the disk image has already been deployed, perform the following steps to remove the image from each target device. The following information is divided by network operating systems.

For NetWare:

The Global Unique Identifier information is stored in a 16-byte file on the `SYS:\SYSTEM` subdirectory of the NetWare server. This file is created and populated with the Global Unique Identifier when HP Systems Insight Manager performs an SNMP SET command to the NetWare server.

To remove the permanence of the Global Unique Identifier:

   a. Delete the file `\SYSTEM\CPQBSSA.CFG` in the NetWare SYS volume.
   b. After the file is deleted, restart the Management Agents and HP Systems Insight Manager assigns a new Global Unique Identifier when the system is discovered.

For Microsoft® Windows® NT:

Insight Management Agents create the Global Unique Identifier information in an entry in the Microsoft Windows NT registry.

To remove permanence of the Global Unique Identifier:

   a. Remove the entry:
      HKEY_LOCAL_MACHINE\SOFTWARE\Compaq Insight Agent\hostGUID
   b. After the entry is removed, restart the Insight Management Agents services. A new Global Unique Identifier is automatically generated.

When changing the access level, a valid account and password for the System Management Homepage are accepted, but the Web page indicates that a different account is logged in.

For some browsers, this occurs when pages previously accessed are stored in the cache of the browser (Internet caching). When accessing these pages again, the browser displays them from the cache, instead of regenerating the pages. Management HTTP Server does not support Internet caching. To disable Internet caching:

From Microsoft Internet Explorer:

1. Select **Tools>Internet Options**.
2. Select **Settings** under the **General** tab.
3. Select the **Every Visit to the page** radio button in the "Check for newer versions of the stored pages" section.

For Netscape:

1. Select **Edit Preferences>Advanced (expand)>Cache**.
2. Under the Compare the page in the cache to the page on the network heading, select the every time I view the page radio button.

**NOTE:** Enable cookies in the browser. They are required for security.

# When attempting to browse to Web-Enabled System Management software on port 2381, the system is not accessible because of an invalid password

This issue is due to either of the following conditions:

- This system is not fully configured and is not accessible because there is not a valid administrator password. An administrator password must be configured by either reinstalling the Web-enabled System Management software or following the instructions in the Security white paper located at http://www.hp.com/manage.
- The system was installed without configuring the passwords for the administrator, operator, or user accounts. Setting an administrator password is required for Web-Enabled System Management software to function correctly.

To resolve this issue, perform any of the following actions:

- Consult the installation instructions for the Web-Enabled System Management software for information about how to use the system software configuration tool to preconfigure components before silent updates.
- Reinstall the software after configuring the component package to contain an account password.
- Install the software using a manual procedure to be prompted for the password on the managed device.
- Use the HP Systems Insight Manager application launch feature to update the `CPQHMMD.ACL` on servers already installed.

**NOTE:** The HP Systems Insight Manager application launch feature should only be administered as a last resort.

## Known browser issues

The Windows® NT has been tested with the following browsers:

- Microsoft® Internet Explorer 4.01, 5.0, or later and Netscape Communicator 4.51, 4.7, or later on Windows® 95, Windows® 98, Windows® Millennium Edition, Windows® NT 4.0, and Windows® 2000
- SNMP configuration pages have been tested under Microsoft® Internet Explorer 5.0 or later. Netscape Communicator is not supported.

The Novell NetWare software has been tested with the following browsers:

- Microsoft® Internet Explorer 4.01, 5.0, or later and Netscape Communicator 4.51, 4.7, or later on Windows® 95, Windows® 98, Windows® Millennium Edition, Windows® NT 4.0, and Windows® 2000

The minimum browser requirements must be met for the Insight Management Agents for Servers to work correctly.

Depending on how they were implemented, some browsers might not work correctly when used with different operating systems.

- Internet Explorer does not print background colors and images by default.
- When switching from the Insight Management Agents browser window to another application, colors in the browser window change or flash. This is not specific to the window, but might happen when looking at other pages with a browser under the same conditions.
- When the browser window is resized with Netscape Navigator 4.x, the window or frames within the window might go blank. This is because JavaScript in the page is not being evaluated. To view the screen, right-click in the frame and select **Reload Frame**.
- Frame sizes are optimized for medium-sized fonts. If you switch your browser to use larger or smaller fonts, then you must manually adjust the frame layout.
- A JavaScript error might occur when displaying an IML page containing a very large IML in Netscape Navigator.

**NOTE:** A large IML does not cause an error in Internet Explorer, but it does take a long time to load (more than four minutes).

- When a SET operation is executed in Internet Explorer, the browser opens a new window to display the updated template page if the security settings are configured to medium or high. To resolve this problem, set the security level to low.

  To set the security level to low perform the following steps:

  a. Select **Internet Options** from the **View** menu in the browser.

  b. Select the **Security** tab, and then click **Custom Level**.

  c. Select **Low**.

d. Click **Reset>OK**.

- There are known browser issues in the Management Agents for Tru64 UNIX. However, many have been corrected in later releases. For additional information, see the *Management Agents for AlphaServers for Tru64 UNIX Reference Guide.*

## SNMP community string issues

- In NetWare, the community string can be changed through the INETCFG utility. After the community string has been changed, the administrator must restart the server at a convenient time to have the change take effect. This restarts the Novell SNMP with the new community string and enables the Web Agent to utilize it.

- In Windows® NT, if the SNMP community string is changed, the SNMP service does not recognize the change until the SNMP service is stopped and restarted from the Services Control Panel applet. If the SNMP service is not stopped and restarted, then the Web Agent is unable to get any SNMP data and the HTML pages do not contain any data.

- Service Pack 4 for Microsoft® Windows® NT 4.0 enables SNMP community strings with read-only access or no access to be added to a system. If a read-only or read/write community string has not been defined, then the Web Agent is unable to get any SNMP data and the HTML pages do not contain any data. Unless a read/write community string is defined, you do not have write access, even if you log on to the Web Agent as administrator or operator.

- In Windows Server® 2003, manually configure the community string:

  a. From the **Start** menu, select **Programs>Administrative Tools>Services**.

  b. Double-click **SNMP Service**, and then click the **Traps** tab.

  c. In the Community Names field, enter a community name string. If a community name already exists, select it. If one does not exist, enter public in the Community Names field, and click **Add**. The default community string for Insight Manager is public. If a different community string is entered here, it must also be entered on the management console that is responsible for the system. To change the community string (community strings are case-sensitive) in HP Systems Insight Manager, see the *HP Systems Insight Manager User Guide* section, "Setting Up SNMP Community Strings."

  d. Under the Trap Destinations list, click **Add**.

  e. In the IP Host/Address or IPX Address field, enter the IP address of the management console. This address identifies the management console to receive the alert when the Server Agents detect a significant event.

  f. Click **Add>OK**.

📝 **IMPORTANT:** For Windows Server® 2003, Windows® 2000, Windows® NT, NetWare 5.1, and NetWare 6.0 (SNMP Only), enter the Monitor and Control community strings for the device. The Insight Management Agents and HP Systems Insight Manager use these community strings to communicate with the OS SNMP service. Without a Control community string, certain operations cannot be performed, such as clearing the IML or changing agent configuration settings.

- In Tru64 UNIX, the SNMP daemon must be stopped and restarted before a change in the SNMP community string is recognized. To stop and start the SNMP daemon, log in as root and use the following commands, respectively:

  # /usr/sbin/snmpd stop

  #/usr/sbin/snmpd start

## Management Agents for Servers for Windows® issues

As a preliminary troubleshooting step, always examine the Windows Event Log by starting the Event Viewer application. Management Agents for Servers and other installed software log significant events into the Windows® Event Log, which might help in diagnosing a problem. Also, always install all HP drivers from the SmartStart CD before installing the Management Agents for Servers.

### Installation issues

### Cannot manage an HP 32-Bit SCSI-2 controller

If an HP 32-bit SCSI-2 controller is added to an existing managed server, activate the SCSI Information agent. To activate the SCSI Information Agent, perform the following steps:

1. From the Control Panel, run the Management Agents.

2. Click the **Service** tab to display the list of active and inactive agents. A SCSI filter monitor is required for SCSI management.

3. Select **SCSI Information** from the list of Inactive Agents, and then click **Add** to move it to the Active Agents list.

4. Click **OK**. When prompted to restart the Management Agents, click **Yes**.

### Insight Manager cannot manage a system

If the Microsoft® SNMP service was installed after installing the Management Agents for Servers, run Install from the Management CD, and select **Express** to automatically update the Management Agents.

### Cannot delete the CPQMGMT.CPL file when uninstalling or upgrading

When running Windows® 2000, close the Control Panel before deleting the CPQMGMT.CPL file.

## Insight Manager issues

### Device not manageable

A black indicator appears for the device on the device list.

1. Verify that the TCP/IP and SNMP services are installed and running under Windows. Check the Services Control Panel application for status.
2. Verify that Management Agents for Servers are installed and running under Windows. Check the Services Control Panel application for Insight Agents.
3. Verify that the device community string matches the community string specified in Insight Manager. The device community string is located in the Networks Control Panel application under Configure SNMP Service. The Insight Manager community string is set in the Device Setup window from the management console (select **Device Setup** from the Task List window). For more information, see "Setting Up SNMP Community Strings" in the *HP Insight Manager User Guide*.

> **NOTE:** Community strings are case-sensitive.

4. Verify that network communications with Insight Manager are operational. Invoke the Windows ping command from an MS-DOS prompt.
5. If the SNMP service was installed after the Management Agents for Servers software, then rerun the Server Agents setup program. Always install the agent software after the SNMP service.

### A majority of buttons for the device are disabled

The System Information Agent is not loaded.

Open the Server Agents Control Panel by double-clicking the icon in the Windows® Control Panel. Verify that the System Information Agent is located under the Active Agents.

### Missing NIC information

Management Agents for Servers for Windows® provides full information on NICs if three conditions are met:

- The interface must be bound to the TCP/IP protocol stack. Verify the NIC bindings by entering the Bindings section of the Network Control Panel application.
- The interface cannot be bound to an intermediate driver ("virtual NIC") unless the intermediate driver is specifically supported by the HP NIC Agents. Examples of supported intermediate drivers are HP Network Fault-Tolerant drivers.
- To include all of the interface statistics, the NIC driver must support the optional NDIS Object IDs (OIDs) for management information. All HP controllers support these OIDs. For other controllers, contact your hardware vendor.

### Missing drive array physical drive information

The HP Drive Array device driver can provide full information on HP Drive Arrays only when the drives are properly initialized. All drives currently shipped with HP systems were initialized in the factory. However, if a drive was replaced because of a hardware failure, or the computer was purchased before this service was provided, these drives might not be initialized. To initialize the drives, perform the following steps:

1. Shut down Windows® from the Start menu by selecting **Shutdown>Restart**.
2. Run HP Diagnostics. If HP Diagnostics is not installed on the hard drive, create an HP diagnostics diskette using Diskette Builder. Insert the HP Diagnostics diskette into the diskette drive of the monitored system, or run Diagnostics from the hard drive.
3. Restart the system.
4. At the Main **Program** menu, select **Test Computer**.
5. At the next display screen, select **View Device List**.

📝 **NOTE:** The HP Diagnostics utility initializes physical drives attached to HP Drive Arrays.

## Disk Subsystem button disabled in the Disk Storage window

This condition might result because the Drive Array Agent is not loaded.

Open the Management Agents by selecting the icon from the Windows® Control Panel. Verify that the Drive Array Information is located in the Active Agents lists.

## SCSI Adapter button is disabled

This condition might result because the HP device driver is not loaded.

Load the device driver using one of the following methods:

- If an HP SCSI controller is installed in the monitored system, load the correct device driver. For details on loading the appropriate driver, see the ProLiant Support Pack for Microsoft® Windows® 2000 or the ProLiant Support Pack for Microsoft® Windows® NT 4.0. If the SCSI device is located on a SCSI controller that is not supported, such as the HP 6260 controller, the button remains disabled.
- If the SCSI device driver was installed after the Management Agents software, run the install program from the distribution media and select **Update Express**. The Management Agents for Servers software does not load SCSI device monitor software unless an instrumented device driver, such as an HP SCSI device driver, is present.
- If the SCSI Adapter button is disabled, open the Management Agents by selecting the icon from the Windows® Control Panel. Verify that the SCSI Information agent is located in the Active Agents list.

## Disk Subsystem button is missing in the Disk Storage window

A missing Drive Array or SCSI Adapter button indicates that the monitored device is not properly configured.

Run the HP System Configuration Utility to configure the system, or run the Setup Utility to configure the ISA system.

## No SNMP traps or alarms received

SNMP is not configured correctly. To configure the SNMP, perform the following steps:

1. Open the Network Control Panel by selecting the icon from the Windows® Control Panel, select the SNMP Service, and click **Configure**.
2. Verify that the SNMP Service is correctly configured with the appropriate destination information. Be sure the community name and host name/IP address is configured correctly.
3. Use the Event Viewer to see if the system event log is full. If the event log is full, SNMP cannot generate traps.
4. Use Test Trap from the Management Agents for Servers Control Panel to verify correct operation.

## Problems using thresholds and SNMP address-specific security

Management Agents for Servers cannot read thresholds when SNMP address-specific security is enabled. Thresholds can be configured from Insight Manager, but no traps are received. When an agent event with ID 2355, Category 9 occurs, the following text appears in the System Event Log:

The Threshold Server Agent SNMP API failed. The data contains the error code.

This error occurs because the device cannot issue SNMP requests to itself. To resolve the error, perform the following steps:

1. From the Control Panel, click the **Network** icon.
2. In the Installed Network Software List, select **SNMP Service**.
3. Select **Configure>Security**.
4. In the SNMP Security Configuration dialog box, enter `localhost` or the address `127.0.0.1` to the list of host addresses from which the SNMP agent accepts packets.
5. Click **OK** to exit the SNMP Security Configuration dialog box.
6. Click **OK** to exit the Network Settings dialog box.
7. Reboot to make the changes take effect.

## Problems if the address 127.0.0.1 is not added to SNMP host list

The following problems occur only if the address 127.0.0.1 is not added to the SNMP host list if SNMP host security is used in Windows® NT or Windows® 2000.

- The following Event Log error messages appear:

The HP Foundation Agents service could not terminate agent "CPQMHOST." The data contains the error code.

The HP Foundation Agents service could not start agent "CPQMHOST." The data contains the error code.

- NIC information does not appear.
- Server Status Information appears incorrectly. For example, the Server Status information is highlighted in green. However, when the customer drills down to mass storage, the Server Status information is highlighted in red. Therefore, the upper-level view of the information incorrectly displays the status of the server.

The customer must add the address 127.0.0.1 to the SNMP host list if SNMP host security is used. The Management CD provides a utility that adds the address 127.0.0.1 to the host list if the customer does not want to add it manually. The utility file is named lhost.exe and is located in SP12205.

### Missing ProLiant Storage System information

The ProLiant Storage System driver is not installed.

Verify that the ProLiant Storage System driver appears under the Devices Control Panel icon in Windows NT 4.0. In Windows® 2000 select the **Administrative Tools Control Panel** icon and then the **Computer Management** icon. The driver is shown under the System Devices in Device Manager. If it is not listed, install it from the ProLiant Support Pack for Microsoft® Windows® NT 4.0 or the ProLiant Support Pack for Microsoft® Windows® 2000.

### ASR POST failure reported

This is caused by an older version of the Systems Management driver.

Upgrade the Systems Management driver from the latest version of the SmartStart CD.

### Management Agents for Servers

The Windows® NT software has been tested with Microsoft® Internet Explorer 4.0 on Microsoft®Windows® NT 4.0, and with Netscape Navigator 4.04 on Microsoft® Windows® NT 4.0.

The minimum browser requirements must be met for the Web-Enabled Management Agents for Servers to work correctly.

Depending on how they were implemented, some browsers might not work correctly when used with different operating systems.

## Other problems

### Tape device error detected by Windows® backup

At startup, the Windows® backup application returns the following error message:

Tape Drive Error Detected

A tape drive has been detected and the tape driver has been started. However, the tape drive is not responding. Be sure the tape device power is on and cables are properly connected.

This message appears if the SCSI Information Agent is collecting data from the tape drive while the backup software is attempting to start (since only exclusive access to the tape drive is allowed). If this message appears, perform the following setps:

1. Select **Operation>Hardware Setup**.
2. Reselect the tape drive to use. If these actions do not eliminate the error message, the tape drive might not be functioning properly.

## Management Agents for Servers for NetWare issues

### Inability to change any values on the managed system or to mark errors as corrected

1. Verify that the SNMP NLM was loaded with the proper community string settings.
2. Verify that the community string setting on the management application matches with the one set on your NetWare server when you loaded the SNMP.NLM. For Insight Manager, select **Device Setup** from the Task List window. The community string is set in the Device Setup window.
3. Verify that sets are enabled using CPQAGIN.

### No SNMP traps or alarms received for NetWare

Verify that the TRAPTARG.CFG file contains appropriate destination information. A sample TRAPTARG.CFG file is located on the Server Management Agents for NetWare diskette in the \NOVELL\ETC directory. It should be stored on the NetWare SYS volume in the \ETC directory. When entering trap target addresses, enter the address in the appropriate protocol section and indent each address.

### System restart to disk-based utilities fails for NetWare

If you click **Reboot** on the Insight Manager display, and select the option to boot to the disk-based utilities, the server might fail to start the disk-based utilities. Use the System Configuration utility to verify that the utilities are actually installed on the system partition.

### Inability to view Web pages on the NetWare server

1.  Verify that the latest Novell operating system patch is installed on the server to provide a recent version of `TCPIP.NLM`. Download the latest patch from the Novell Website, and install the patch on the server.
2.  Verify that a `HOSTS` file resides on the NetWare server in the `SYS:ETC` subdirectory. The HP HMMO Utility (CPQHMMO) requires a HOSTS file to support server Web pages from the server. This file contains the IP address and the server name.

📝 **NOTE:** The Novell NetWare software has been tested with Microsoft Internet Explorer 4.0, 5.0, or higher and Netscape Navigator 4.05, 4.51, and 4.70.

## Problem using disk imaging software

### Global unique identifiers are the same for all devices when using disk imaging software on servers

Solution 1

If the disk image has not been taken, perform the following procedures after installing the Management Agents on the source machine and capture the image before restarting the Management Agents.

1.  Uninstall all Management Agents from one of the devices.
2.  Use the Disk Imaging software to copy the configuration from the device without the Management Agents installed.
3.  Use the disk image to copy to the target devices.
4.  Reinstall the Management Agents on all the devices.

Solution 2

If the disk image has already been deployed, perform the following procedures to remove the image from each target device.

The Global Unique Identifier information is stored in a 16-byte file on the `SYS:\SYSTEM` subdirectory of the NetWare server. This file is created and populated with the Global Unique Identifier when HP Systems Insight Manager performs an SNMP SET command to the NetWare server.

1.  To remove the permanence of the Global Unique Identifier, delete the file `\SYSTEM\CPQBSSA.CFG`, in the NetWare SYS volume.
2.  After the file is deleted, restart the Management Agents. HP Systems Insight Manager assigns a new Global Unique Identifier when the system is discovered.

# Glossary

| | |
|---|---|
| Automatic Server Recovery (ASR) | A server feature designed to automatically restart the server after a critical hardware or software error. If a critical error occurs, the server records the error in the Server Health Logs, reboots the system, and pages (if a modem is installed in the server). |
| Client | A computer connected to a server on the network. |
| Community String | The SNMP Community String is similar to a password, offering a limited amount of protection for the SNMP data. |
| HP Management Agents for Servers | Software that can query a manageable server and provide information that responds to SNMP requests for data. |
| HP Utilities | HP Utilities have the capability to set up or modify the system and include various diagnostic programs. |
| Corrected Memory Log | This log contains a list of corrected memory errors. |
| Desktop Management | A feature of HP Systems Insight Manager that allows you to monitor HP PCs being used as clients. |
| In-band | Refers to the capacity to deliver information through existing network hardware. Synonymous with "on the network." |
| Logical Drive | Multiple physical drives connected in a HP Drive Array to the same controller and combined to create logical drives. All available physical drive capacity is used by the logical drive as if it were a larger drive subsystem. By combining several physical drives, special fault tolerance and performance features can be used. |
| Managed Device | A device managed by a management console. Devices include servers, clients, routers, switches, and hubs. Servers and clients cannot be managed devices unless they have HP Management Agents installed. |
| Management Information Base (MIB) | The document or file that defines all manageable traps known to the management agent and management application. |
| Management Console | The PC, workstation, or server that is running HP Systems Insight Manager. |
| Monitored Item | The item that HP Insight Manager manages or monitors, or the information that HP System Insight Manager collects. |
| NetWare Peripheral Architecture (NWPA) | The goal of the NetWare Peripheral Architecture (NWPA) is to provide NetWare Version 4.x, and IntranetWare customers with broader and more reliable driver support for host adapters and storage devices. |
| NetWare Loadable Module (NLM) | Executables that run under the Novell NetWare operating system. |
| Network Interface Controller (NIC) | An adapter card installed in a PC, workstation, or server that allows the PC or workstation to communicate with other devices connected to the same network. This term usually implies a local area network (LAN) adapter card. |
| Out of Band | The capacity to deliver information by modem. Synonymous with "off the network." |
| Physical Drive | Multiple physical drives connected in a HP Array Controller to the same controller and combined to create logical drives. The logical drives use all of the available physical drive capacity as if it were a larger drive subsystem. By combining several physical drives, you can use special fault tolerance and performance features. |
| Point-to-Point Protocol (PPP) | A standard defined by the Internet Engineering Task Force. PPP provides a standard method for transporting multiple protocols over a point-to-point link. |

| | |
|---|---|
| Simple Network Management Protocol (SNMP) | SNMP defines a set of commands that a management application uses to retrieve or change the values of items a management agent makes available. |
| SNMP Multiplexing (SMUX) | The protocol defining a mechanism for communication between SNMP agent and multiple user daemons (called SMUX peers). The SMUX protocol has the advantage of being vendor-independent. With SMUX, a single SNMP agent can be used to control and monitor devices from different vendors, regardless of how each vendor has implemented SMUX peers in their own products. |
| Threshold | A preset limit that produces an alarm when reached or exceeded. |
| Trap | An indicator of a change or an error condition. *Also called* alarm. |
| Uninterruptible Power Supply (UPS) | A battery that supplies continuous power to a computer system in the event of a power failure. |
| Windows Management Instrumentation (WMI) | Windows 2000 and Windows 98 extensions to WDM which provide an interface between the operating system and instrumented components, allowing the instrumented components to provide information and notifications. |

# Index